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PUBLICATION 283

BOTANICAL SERIES VOLUME X

FLORA OF THE LANCETILLA VALLEY HONDURAS

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CHICAGO, U. S. A.

JANUARY 15, 1931

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

580.5
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N. H. L.

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FLORA OF THE LANCETILLA VALLEY HONDURAS

PAUL C. STANDLEY

INTRODUCTION

Botanical institutions receive frequent requests for publications describing the collective vegetation and the individual species of the flora of Central America. They come from amateurs and botanists who live in the region or who wish to visit it or to study its plants. To such correspondents the reply must be made that there is no publication covering satisfactorily the whole of Central America, and very little that treats of the floras of the separate countries. Besides the bare list of species published fifty years ago by Hemsley in the *Biologia Centrali-Americana*, when only a comparatively small proportion of the Central American species were known, the only works at all useful are the *Lista Preliminar de la flora salvadoreña*, by Dr. Salvador Calderón and the present writer, which is only an annotated list of species, and the more recent and somewhat more comprehensive *Flora of the Panama Canal Zone* that appeared in 1927.

It is obvious that there is room for another descriptive botanical work dealing with even a very limited portion of Central America, for many more, in fact. The present flora is more than a mere list of the species growing in the Lancetilla Valley, but something less than a descriptive manual. Although intended to cover only a very small and limited area, the area is one altogether typical of the wet lowlands of the whole Atlantic coast of Central America. A botanist working anywhere along the Central American coast immediately discovers that the area in which he is engaged is conspicuously different botanically from all the others that he has visited previously, but he must admit that the great majority of the species are common to all the localities that he has visited.

On the Atlantic coast the writer is familiar with areas in Panama, Costa Rica, Honduras, and Guatemala, and he remembers each one as having distinctive characters common to none of the others, although the most plentiful and abundant plants are everywhere the same.

The present enumeration of lowland Honduran plants includes a vast majority of the species found in any region along the Central American coast, and even far inland. On the other hand, no farther away than Puerto Barrios, Guatemala, or Puerto Castilla, Honduras, there are found at least a few conspicuous trees and herbs, frequently very characteristic ones, that are not known to grow about Lancetilla. The *Flora of the Lancetilla Valley* will, nevertheless, be found nearly as useful for study purposes anywhere in the lowlands of Central America as in Honduras. For that matter, it will be found to contain some mention of a large proportion of the commoner plants that inhabit southern Mexico, the West Indies, and even northern South America.

The scope of this flora is a limited one. It is intended to cover primarily the Lancetilla Valley, which runs inland along the Tela River for five miles from the port of Tela, Honduras. At Lancetilla is located the Experiment Station of the Tela Railroad Company, under the direction of Wilson Popenoe. Stimulated by the enthusiasm of the director of this station, and encouraged by the friendly and helpful attitude toward scientific investigation always manifested by the United Fruit Company, and especially by its present president, Victor M. Cutter, this station has become a headquarters for natural history investigations. Because of exceptionally favorable conditions existing here for such work, there is good reason to expect that Lancetilla Station will become increasingly important as headquarters for research work, and we may hope to obtain, through the cooperation of interested specialists, a detailed account of the botany and zoology of this little-known part of Central America. In botany, at least, no better center for field work could be chosen, since heretofore nothing at all has been known of the Honduran flora. The collections made by the writer on the coast and in the interior are the first of any extent to have been procured anywhere in the whole Republic of Honduras. Inasmuch as they represent exploration in very limited areas, it is evident that at present we know but little of Honduran vegetation. Practically all the interior, a highly diversified mountain area, and even most of the coast still await exploration, and there is no doubt that they will yield a profitable return for the effort expended in exploring them.

The field work upon which this published flora is based was performed from November, 1927, to March, 1928, while the writer was a member of the staff of the United States National Museum. The work was conducted through the cooperation of the National

Museum and the Arnold Arboretum of Harvard University, through the interest of Professor Oakes Ames, and with the hearty support of Victor M. Cutter, president of the United Fruit Company, and of Wilson Popenoe, director of Lancetilla Experiment Station of the Tela Railroad Company. Throughout the winter, the somewhat fickle weather permitting, work was carried on from headquarters maintained at Lancetilla.

Never have I worked under such favorable conditions. With provision made for every bodily comfort and with every convenience for collecting and preserving specimens, there was none of the waste of time and effort usually demanded by worries regarding the manifold problems ordinarily involved in even a moderate amount of such work. No more convenient location could be found. Virgin forest may be reached in five minutes from the station, and there is a choice of routes in every direction, each one leading to some more interesting locality. Daily trips in all directions failed to exhaust the flora, although it must be confessed that toward the end of the winter additional species were not so plentiful as formerly. There is every reason, however, for believing that residence here during the summer months would add a substantial number of species not observed during the winter.

Most of the writer's attention was devoted to the immediate vicinity of Lancetilla Station, and consequently the limited area known as the Lancetilla Valley was explored rather thoroughly. This consists of the rugged valley of the Tela River, up to the tops of the hills which rise on either side to an elevation of about six hundred meters. Frequent excursions were made also about Tela, along the coast, in a region with decidedly different botanical features from those existing near Lancetilla. Since the distance from Lancetilla to Tela is only three miles, and that to the tops of the hills considerably less, it may be seen that the region is a small one.

It is quite unfair for one unacquainted with Central America to judge such an area by one of similar size in the United States. A comparison is scarcely possible. In several years one person would be unable to explore every bit of it, and until he did, he could not be certain that he had obtained all the species of plants. Moreover, he probably would be unable to find all of them in proper condition for collection in a single year. In a similar area in the United States it would be altogether impossible, I believe, to find an equal number of species.

The Lancetilla flora, however, is intended to include all the species collected in the Tela Division of the United Fruit Company, although the Lancetilla Valley is the only part of this region that was covered at all thoroughly. The Tela Division extends inland some thirty miles along the Ulua River, to and beyond the town of Progreso, which lies in a region much drier than that about Tela. Obviously it would be impossible to cover in a few months a large tropical area like this. Several visits were made to Progreso, to Quebrada Seca near by, and to La Fragua, and two brief excursions were devoted to the Guaymas District. All the species collected in the Tela Division have been listed in this report, but there doubtless exist several hundred more which were not collected.

Toward the end of the winter a trip of three weeks was made to the mountains of the interior of Honduras, and as far southward as the capital, Tegucigalpa. Several hundred plants were collected on the pine-clad mountains about Siguatepeque, in the Department of Comayagua, but these are not listed here, since they are representative of an altogether distinct flora, more like that of the Pacific coast of Central America.

GEOGRAPHY AND INHABITANTS

The Lancetilla Valley is situated three miles inland from the port of Tela, a little west of the center of the northern coast of Honduras. It is a newly settled region, and can not compete in historical interest with Puerto Cortés, whose very name is significant, or with Truxillo, to the east. The latter is celebrated in history as the first spot upon the American mainland on which the Spaniards set foot. The present town of Truxillo is the most picturesque and the most pleasantly located of all the ports of Central America, being the only one, in fact, that I have ever seen which has any attractive points at all, with the possible exception of La Libertad, in Salvador. Lying on the lowest slopes of a high mountain, on an elevated bench which provides the drainage so badly needed in other ports, its low white walls, its dignified old, very old, church, and its palm-thatched Carib village give it an appearance quite in keeping with its more than four hundred years of existence. Seldom, even in the most conservative parts of the interior, have I seen a settlement so permeated with the atmosphere of Spanish colonial days.

But Tela is quite another place, a modern town, with more comforts and conveniences, it is true, but without picturesqueness. It is too "American" (the Central Americans themselves use this word,

meaning North American, when they desire to indicate progressiveness) to be picturesque or interesting. Along this coast must have tramped Hernán Cortés and his followers on their historic march to Truxillo, but there is no visible reminder of the fact. No one can appreciate better than a botanist the heroism of that epochal journey of Cortés, across the swamps of southern Mexico, Petén, and Honduras. Attempt to make the journey now, with the knowledge that there are railroads and convenient settlements close at hand, and see what difficulties you will have. Whatever may be said of the Spaniards of that day, there is no denying their courage and their endurance, and of these qualities no man had such an ample stock as the conqueror of Mexico.

The difficulty of exploring the flora of the Honduran coast results from the broken surface of the country and especially from the abundance of thickly grown and impenetrable swamps and the extensive marshes. If it were not for the substantial clearings that have been made and the railroad lines that have been constructed, it would be almost impossible to explore the region at all, for travel in any direction would be terminated quickly by some obstacle which scarcely could be surmounted.

All but the most unobservant visitors from the North soon notice one curious feature of the Tela region which is in striking contrast with the United States—there are no wagon roads. Furthermore, there are very few trails. One misses here the picturesque and friendly oxen and the creaking carts. Only in those parts of the coast where sugar cane is grown are there oxen, and consequently roads. This absence of cart roads is almost universal in the *tierra caliente* of Atlantic Central America. Their place is taken by the banana railroads and their innumerable branches, over which there are operated light motor cars or even automobiles.

As the Honduran shore is approached, there is seen beyond the fringe of mangrove swamps or the sandy beaches an expanse of comparatively level country lying between the hills and mountains, which here approach closely to the shore. In some places the hills advance to the sea, and the more level land extends like bays and coves of verdure between them. The major part of the arable land of the Tela region consists of the flood plain of the great Ulua River and its tributaries, and it is along and near this river, and generally at some distance from the town of Tela itself, that most of the bananas are grown.

The Lancetilla Experiment Station is situated in a very narrow valley, that of the Tela River, which is a short stream across which one can walk easily, unless averse to wetting one's feet—a stream with a swift current of clear, cool water. During a heavy rain this river may become a raging torrent, but it soon subsides to its normal volume. There is but little low or swampy land along its course, the banks being usually elevated and well drained.

On either side of the valley rise steep-sided hills, to an extreme height of 600 meters. They are densely forested, deep green, and very beautiful, especially when half veiled with clouds after rain storms. Above Lancetilla the valley narrows rapidly, its sides become steeper, and it soon ends against a high wall of hills, since it has the familiar form of the "box" canyons of the West.

Tela lies at the mouth of this valley, where the Tela River empties into the sea. A railroad branch runs eastward to Jilamo Junction, through banana plantations now mostly abandoned, to connect with another railroad that runs to La Ceiba, the first port to the eastward. West from Tela extends the main line of the Tela Railroad, which runs through the principal banana plantations of the company, to and beyond the inland town of Progreso, on the Ulua River. Innumerable branches of the railroad cover all the banana plantations, to provide for transportation of the fruit to the port.

Practically all the land within this area that is fit for the purpose is covered with banana plants which, however beautiful when standing alone or in moderate quantities, become exceedingly monotonous when massed in plantations many miles in extent. Between the banana plantations, however, are large areas unsuited for their cultivation. These consist, near the coast, of wide marshes and of densely wooded swamps which can not, or at least have not, been drained. Much swamp land has been ditched and planted. The most spectacular of these unused areas is the great Toloa Swamp that is crossed by the railroad as it approaches the Ulua River from Tela. It is like many other swamps or marshes in Central America, a shallow lake with an abundance of aquatic plants, and such a profusion of water birds as one sees only in the tropics.

Eastward from Tela there is more of this open, swampy land, and also wooded swamps, in which the back water rises at high tide. To cross them at such a time one must follow a guide and wade water to the knees, although at low tide it is possible to walk almost dry-shod along the same trails. It is across such a swamp as this that one reaches the picturesque seashore Carib village of Triunfo.

Although the Caribs are much disliked by the Spanish people, a northerner will admire the neatness and cleanliness of their villages, in striking contrast to most Spanish coast towns.

One of the outstanding features of the Tela region, and a characteristic of the Atlantic lowlands generally, is the absence of exposed rock. In the lower places any rocks soon would be covered with silt, but even in the hills rocks seldom are seen except along the watercourses, where streams fall over stony channels. In a few places, especially along the Ulua and still farther inland, there are exposures of a white rock that contrasts sharply with the green vegetation. Probably all the hills and mountains soon would be equally exposed if the protecting forest were removed.

Most of the region covered by this flora lies in the Department of Atlántida, Honduras, but the part toward Progreso belongs to the Department of Yoro. Although politically referable to Central America, the banana country is in most respects alien to Central America proper. In Costa Rica there is a saying that, after landing at Limón, one does not arrive in Costa Rica until the town of Turrialba, many miles inland, is reached. The real Central America consists of the interior and of the Pacific coast, which are without foreign influence. This is true in spite of the fact that much of the wealth of these countries is derived from the banana plantations of the Atlantic coast. One who knows only the banana country, knows nothing of Central America. On the coast and in the interior everything is different—the country, climate, people, customs and culture, plants, animals, and even the food.

On the banana coast North American customs prevail, and North American standards, so far as they can be maintained. This is the natural result of the influence of the Americans who direct the work of the large banana properties. Here on the coast one is likely to hear English spoken more often than Spanish. Besides the ordinary tongue, one makes the acquaintance of a peculiar and extraordinary "English," that weird mingling of English words and African grammar affected by another element, the West Indian negroes, who always are found in large numbers along the coast. They seldom settle in the interior, partly, it is said, because they are unable to endure the upland climate, but more probably because of the antipathy of the Spanish population.

Another element of the coast, scarcely alien but certainly not Spanish, is composed of the Caribs, who dwell in considerable numbers in Honduras and elsewhere along the Central American coast. Their

homes are always on the seashore or on the banks of the larger streams. These Caribs are doubtless a very different people from the true Caribs who inhabited the Antilles and the coast of northern South America 400 years ago. They consist now of the descendants of the original Caribs and West Indian slaves who escaped to the Spanish Main. They speak their own peculiar and difficult language, with its astonishing intonation, and it is not unusual to find Carib children who speak equally well—or badly—Carib, Spanish, and English.

The Spanish laborers in the banana plantations are not of homogeneous origin. Many are Hondurans from the interior, lured to the coast by the comparatively high wages. Others come from Nicaragua, and still more from overpopulated Salvador, and there are found occasional stragglers from other Central and South American countries. With all these elements, and representatives of many nations of Europe, besides occasional Chinese and East Indians, the population of Central American coast towns is rather cosmopolitan.

CLIMATE

In climate the Atlantic coast of Central America is, so far as we know, rather uniform. Certain localities, such as San Juan del Norte, Nicaragua, are famous for their heavy rainfall, but probably there are no trustworthy data to support their reputation.

Everywhere along the coast the rainfall is heavy, and more or less continuous throughout the year. This is in striking contrast with conditions on the Pacific coast, where there is a prolonged dry season, often without any precipitation, from about November to May.

The following table shows the rainfall in inches at Lancetilla Experiment Station from 1926 to 1929. The data for these and the succeeding tables are reproduced here through the courtesy of Hartley Rowe, Vice-President of the United Fruit Company.

	1926	*1927*	*1928*	*1929*
January	26.40	23.91	28.67	11.85
February	9.75	6.40	15.70	0.94
March	5.60	3.08	3.29	0.54
April	4.60	0.17	12.08	0.59
May	6.25	1.26	2.74	5.19
June	1.60	2.96	5.06	6.85
July	7.40	10.41	10.86	12.71
August	8.50	29.12	6.10	13.34
September	4.00	9.96	12.97	9.86
October	16.40	7.89	9.81	17.46
November	36.00	26.15	38.21	7.59
December	9.50	5.66	26.78	46.42
Totals	136.00	126.97	172.27	133.34

These figures cover so few years that it is difficult to draw any conclusions from them. Their most striking feature is the apparent almost haphazard distribution of the rainfall during the year, but evidently the wettest months are November, December, and January. During January, 1928, more than twenty-eight inches of rain fell, nearly half of it on the first day of a *temporal.* For two weeks showers were so frequent that it was possible to do but little botanical collecting.

Rains usually are welcomed, unless they are so violent as to damage bananas and railways, for they cool the air and make living conditions more endurable. During prolonged rainless periods the temperature is excessive and oppressive.

The mean temperature and the mean relative humidity at Lancetilla during 1926–29 are shown in the following tables:

MEAN TEMPERATURE

	1926	*1927*	*1928*	*1929*
January		70.40	70.90	72.90
February		74.50	74.00	74.00
March		72.70	74.90	75.35
April		76.00	77.60	78.48
May		78.40	78.20	78.83
June		80.50	79.20	78.51
July	80.00	78.70	78.80	78.04
August	79.20	78.20	78.80	78.25
September	79.50	78.70	79.30	78.59
October	78.40	76.80	77.10	76.60
November	68.69	73.90	74.60	75.70
December	73.20	74.00	72.00	72.50

MEAN RELATIVE HUMIDITY

	1926	*1927*	*1928*	*1929*
January		89.91	87.00	87.20
February		90.00	85.00	80.00
March		77.00	81.00	77.80
April		75.00	88.00	76.00
May		76.20	84.00	79.45
June		77.00	85.80	84.52
July	74.80	82.00	86.00	84.30
August		82.00	86.20	84.60
September		82.00	88.20	84.50
October	83.00	88.00	89.80	90.30
November	81.00	90.00	92.30	88.40
December	90.90	88.98	90.60	91.00

During the time I spent at Lancetilla, the temperature was found to be rather agreeable and comfortable for the most part, certainly more so than in some other places along the coast. One suffers much more from the heat at Puerto Barrios, Guatemala, Limón, Costa Rica, or Colón, Panama; or at least that is the writer's experience.

At noon, especially in the sun, the heat is intense at Lancetilla, but if sitting quietly one may be comfortable enough. Even when walking or climbing over the trails, one's clothing does not become saturated with perspiration so quickly as in some other places. The highest temperature reported at Lancetilla is 94°, in June, 1927, and April, 1929.

At night the temperature nearly always is pleasant at Lancetilla, as it is generally in the lowlands of Central America. The nights are so delightful, especially when there is moonlight, that one can sympathize in a certain degree with the enthusiasm of those poets who have sung of the delights of the tropics. At Tela a blanket often is needed toward morning, and during an extended *temporal* as many as two blankets may be found comfortable. The lowest temperature recorded for Lancetilla is 53°, in March, 1928. It is rather amusing now, as I look at the temperature records for January, 1928, to find that the minimum was 61°, yet I recall that on several rainy nights during that month a sweater was very comfortable, if not necessary.

At Progreso, the part of the Tela Division that lies farthest inland, although records are not available, there is an agreement of opinion that the heat is greater and more oppressive than at Tela. Doubtless the proximity of Tela and Lancetilla to the seashore have something to do with the matter. It is stated, also, that the rainfall at Progreso is substantially less, and that there is a more definitely pronounced dry season than along the coast.

VEGETATION

The vegetation of the Tela region may be divided roughly into two divisions, the hills or low mountains, and the lowlands. These, it is realized, are differentiated physiographically more than botanically, since many species of plants grow in almost equal abundance on the hills and in the lowlands. Other plants are more particular as to their habitat. At least, such a division into low and high country is a convenient one for purposes of description and discussion.

SECOND GROWTH

Before beginning a description of the natural vegetation, one important factor must be mentioned. This region has been greatly modified by cultivation, and the cultivated land, for the most part, may be dismissed in discussing the native vegetation. The country centering about Tela depends wholly upon banana growing for the existence of its inhabitants, and if that industry were destroyed, the

people would have no choice but to abandon the coast and move to some other field.

Clearing of many square miles for banana planting has destroyed a vast amount of the original vegetation. It is probable that some species have disappeared, at least so far as this area is concerned, although the number can not be very large. At any rate, some of the localities most interesting originally have been ruined botanically. Bananas are planted only in the lowlands, and in this part of Central America they are never cultivated on slopes except the gentlest ones. They require land that is moderately well drained, but naturally swampy ground often is ditched to adapt it to cultivation.

Where bananas are grown, there is no other vegetation of interest to the botanist. Although they are not cultivated so intensively as onions or potatoes, it is necessary to keep down the ranker weedy vegetation beneath them. Consequently the ground covering in banana plantations consists of low herbaceous plants, the most common weeds that it is possible to enumerate. I do not remember ever to have found a single interesting plant in such a place.

Near Tela there are considerable areas of banana plantations that have been abandoned because of the Panama disease, or on account of low productiveness. These are, for the botanist, almost as unproductive as plantations under cultivation. The banana plants persist for years, with a gradual diminution in fruit production, until finally they are choked by coarse herbs, shrubs, and quick-growing trees. In spite of their rank growth, they can not compete indefinitely with native plants. The lower parts of the Lancetilla Valley, except where now cleared for use of the experiment station, consist largely of such abandoned plantations.

Similar to these are the extensive patches of ground which have been cleared at some time for gardens and corn fields or for pasture but are now abandoned. The name "guamil" is applied locally to such places as are covered by second-growth vegetation.

It is astonishing to see how rapidly such abandoned land is occupied by weeds and shrubbery. It is well known that in the wet tropics plant growth is exceedingly rapid, but how rapid it really is can be appreciated only when it is actually observed. Trails cut through the forest, unless kept open, are closed within a few months. If cultivated land is left to itself during the wet season, in the course of a couple of months it will be so densely covered with lusty herbs six feet high that it is practically impossible to force a way through

them without use of a machete. Some idea of the nature of the rank vegetation in such a place may be gained by inspection of the thickets of giant ragweed (*Ambrosia trifida*) flourishing in rich alluvial soil in the Mississippi Valley.

This guamil must be taken into consideration in an account of the local vegetation, since it forms so large a proportion of it. It is composed of the most common and aggressive herbaceous plants, most of which do not exist in virgin forest. Common second-growth herbs are pokeweed (*Phytolacca rivinoides*), *Neurolaena lobata, Eupatorium macrophyllum, Acalypha costaricensis,* and *Pavonia rosea.* Everywhere in such situations there is an abundance of the pale guarumo trees (*Cecropia*), which always are at their best in the second growth, although they are found also frequently enough in primeval forest. The balsa (*Ochroma*) is another tree that thrives under such conditions.

There are a host of shrubs that delight in these situations. Some of them grow almost as rapidly as herbs, and a few quickly attain the size and habit of small trees. Common shrubs of the guamil are *Piper auritum* and *P. multinervium, Gliricidia, Trema, Bursera Simaruba, Acalypha diversifolia, Phyllanthus Conami, Gouania, Belotia, Heliocarpus, Triumfetta, Malvaviscus grandiflorus, Conostegia xalapensis, Stemmadenia, Cordia ferruginea, Tournefortia* spp., *Aegiphila fasciculata, Cornutia, Hyptis verticillata, Lantana Camara, Hamelia patens, Eupatorium odoratum, Baccharis trinervis, Cestrum nocturnum,* and *Solanum diversifolium.* Several prickly plants abound in second-growth thickets. About Tela one of the worst pests of the bananas is the zarza hueca (*Byttneria*), which forms dense interlacing tangles everywhere in exposed thickets. *Mimosa hondurana,* armed with fine, closely set, recurved prickles sprawls over other shrubs, and lays hold of one's clothes in a fiendish manner. Where *Mimosa invisa* occurs plentifully it is quite as formidable a foe, for it is altogether impossible to force a way through it.

The vegetation in the immediate vicinity of Lancetilla, close to the river and on the slopes back of the station, consists in large part of guamil. Nearly everywhere along the whole line of the Tela Railroad, except when passing by marshes or very swampy woods, one sees nothing else but second growth and banana plantations.

In the region of Puerto Arturo, three miles west of Tela, and at a few other places in the Tela Division, pastures have been made for cattle and draft animals. They are overgrown chiefly with Guinea grass, and by the constant grazing of the animals they are kept in

some semblance of a northern pasture, although the grass is much taller and coarser than is usual in the North. Guinea grass grows in great clumps, among which the cattle sometimes wander half hidden, browsing only on the tender, fresher shoots. Para grass also affords good pasture, but it is an untidy plant, sprawling along the ground, and preferring wetter soil.

UPLAND FORESTS

The writer's acquaintance with the upland forests of this area is confined almost wholly to the hills that rise on each side of the Lancetilla Valley. Although these form only a small part of the Tela region, they are so extensive that one may spend many days in tramping over them without exhausting their botanical possibilities.

The hills rise to a maximum elevation of 600 meters (2,000 feet), and except on some of their lower slopes, where they have been cleared for tillage or pasture, they are covered with heavy primeval forest. Their slopes are very steep, and the vegetation so dense and tangled that progress over them is difficult except where trails have been opened. The forest usually is dripping wet, and the atmosphere beneath it is much like that of a northern hothouse.

Leaving the office at Lancetilla, one goes southward across some of the plantings and in five minutes comes to the Tela River, a shallow stream ten yards wide, flowing over a bed of rounded white stones and coarse gravel, across which one may hop from stone to stone if the water is low. Along the banks are many *Ochroma* trees and guarumos. Here grow also rosewood (*Dalbergia cubilquitzensis*); *Pithecolobium arboreum* with its dangling, twisted, red pods; *Cassia reticulata* with great bunches of orange-yellow flowers; and *Casearia arborea* with small red fruits shaped like beech nuts. On the gravel bars the curious bullhorn acacias, to be avoided because every spine harbors a colony of alert and savage ants, form open thickets. Against their trunks are piled masses of sticks and brush, brought down by the last freshet, for this small stream may, after a heavy downpour in the hills, become a wide river, flooding all the lower reaches of the valley with swirling current.

Along the edge of the water the giant leaves of *Xanthosoma*, resembling those of the caladium or elephant ear, are prominent. Here grow bright-flowered cannas and coarse Calatheas. On stones at the edge of the stream *Cuphea utriculosa* forms small clumps, its exposed masses of roots always washed by the moving water.

Across the river one walks for a few minutes through some abandoned bananas, among which appears an occasional bunch of slowly ripening fruit. Such abandoned plants, however, produce but little fruit. Farther on there are thickets of guamil, through which one hurries to escape from the steamy, overheated air, for these thickets afford no protection from the sun.

In a moment one passes from these tangles, with their spines and burs, to the open trail and the deep shade of the tall forest. Here is a broad, well-kept trail, leading up a steep slope close to one of the tributaries of the Tela River, or perhaps it is the main stream itself, since all these mountain watercourses are much alike and of about the same size. A little higher up there has been constructed a small dam, from which the water supply of the town of Tela is taken. It is easy walking here along this plain trail, except where the slope is very steep, or unless it has been raining hard, so as to make a slough of the sticky red clay.

One notices immediately the stillness. Great blue butterflies float silently across the path. Only occasionally is a bird heard. Perhaps a flock of paroquets chatter as they feed on the fruit of a high fig tree, or some macaws or parrots scream as they alight on the branches. This is a favorite haunt of the fine wild turkeys of the region, and for the curassows, but these game birds are hunted so persistently that they are very shy. The mountain quail frequent these woods, but they are seldom seen.

If one walks quietly one may come upon a rabbit-like guatuso or agouti, nibbling at palm seeds, or discover suddenly a band of white-faced monkeys fleeing across the tree tops, leaping deliberately yet to all appearances recklessly from branch to branch. Just before a heavy rain the air reverberates with the thunderous roaring of the howler monkeys, which sounds so much like the racket of a titanic coffee mill. These animals live here in large numbers, but as is the case in most parts of Central America, they are shy and are very rarely seen.

Occasionally a band of peccaries may be scented, and they are heard racing away through the bushes. There are tapirs here, too, and probably an occasional tigre or jaguar. There must be plenty of snakes in these forests, for poisonous serpents, especially the deadly barba amarilla, or fer de lance, are known to be all too abundant on the Honduran coast, but in the months that I spent walking through the woods I saw only a very few harmless snakes and one or two coral snakes.

One's thoughts turn but seldom to snakes, but they are not permitted to stray far from ants. Every botanist who has worked in the tropics awakes to eloquence when the subject of ants or wasps is broached. Pluck a branch from a bush, hold it only a moment in your hand, and immediately you feel the painful bites of several ants. Some of the epiphytes wrenched from the branches swarm with them. Sit for a few seconds on the ground to put your plants in press, and the bites of the tiny pests are felt in unexpected places. When you pick up your press you are the unwilling agent in removing still more of these tireless insects from their birthplace.

The wasps are even more to be dreaded. One always is happening most unexpectedly upon their nests in the most curious places, with painful and memorable consequences.

The customary silence of this great forest and the dimness of the light give it a dreary and foreboding atmosphere much the same as that pervading the deep Douglas fir forests of our own Rocky Mountains. The trees are exceedingly tall, rising to a hundred feet or more, their tops so far above one's head that the leaves are indistinguishable. It is only by examining leaves and fruits and bits of flowers strewn upon the ground that it is possible to form some idea of the nature of the trees composing the forest. These cast-off fragments become so mixed as they fall or drift from the tree tops that often it is impossible to decide which leaves belong to a certain tree, the more so since some of the fallen leaves certainly come from the many creepers that swathe the tree tops.

Some of the trunks, especially those of the figs and ceibas, assume massive proportions, and their enormous weight is supported by radiating, bracket-like buttresses that brace them against the wind. Of course, standing so closely together as they do, these trees do not get the full force of a heavy wind, which is felt only by their tops. When a wind storm is passing over, one feels but little wind below on the ground, but beware of the forest at such a time, for at any moment a heavy branch, already overweighted with epiphytes, torn loose by the force of the storm, may come crashing down. Immediately after a heavy storm is a favorable time for collecting specimens of trees and epiphytes, for many such branches may be found lying fresh upon the ground.

The somber color of the tree trunks accentuates the gloom of the forest. Some of the trunks are smooth and quite free of epiphytes; others are rough and heavily laden with them. Some of the epiphytes, especially the aroids, cling tightly to the trunks, but more of them

clasp the loftiest branches. Such orchids as grow here are likely to perch so high in the air that they are quite invisible.

Most of these trees as well as their epiphytes have small and inconspicuous flowers, but even when the flowers are showy, it seldom happens that they can be discerned from the ground, for they usually appear on the very outside of the foliage in the full sunlight. In order to see what color such a forest does afford, it is necessary to go to an opposite slope, from which spots of color may be seen at the proper season, here and there in isolated patches.

A conspicuous element of this section of the forest consists of the lianas, great woody vines similar to the largest grape vines of northern forests. These vines commonly do not embrace the tree closely but dangle loosely about its trunk, several individuals finding support upon a single tree. A frequent plant of this habit in the forests above Lancetilla is *Marcgravia nepenthoides*, here called cachimba (tobacco pipe), in allusion to the curious form of the flowers, or rather the nectaries, but the flowers are borne at the top of the forest, and are seen only after they have withered and fallen. The fresh flowers attract the hummingbirds, as do the brightly colored flowers of many other plants. Some of the lianas and epiphytes develop long cordlike aerial roots that hang limply from the branches.

As in tropical forests generally, the tall trees do not occur in pure stands but consist of often isolated individuals of many species, representing numerous families. Certain trees do occur here in much greater abundance than others. A very large proportion of this high Honduran forest consists of masica (*Brosimum terrabanum*), masicarán (*B. costaricanum*), wild nutmeg or sangre (*Virola* spp.), carbón (*Guarea excelsa*), sapote (*Calocarpum mammosum*), zapotillo (*C. viride*), and paleta (*Dialium*). Other trees less common but noted more or less frequently are *Naucleopsis*, *Pourouma*, tango (*Zollernia*), *Ormosia* with bright red, beanlike seeds, *Simaruba*, *Protium* and *Tetragastris*, Spanish cedar (*Cedrela*), Honduras mahogany, *Vochysia* with its handsome yellow blossoms, *Astronium*, ceiba, wild figs in great variety, María (*Calophyllum*), *Rheedia*, and silión (*Lucuma izabalensis*). A rare tree is *Aspidosperma*, with broadly winged seeds which sail like butterflies through the air. Occasionally there appears the smooth copper-colored trunk of a giant *Bursera Simaruba*, whose aspect has compelled the application of the apt name of the tree, indio desnudo ("naked Indian").

Looking about in this dense forest, we note that there are two principal levels of foliage: the tops of the tall trees, and also a very

considerable understory at a comparatively low level. This understory consists of smaller trees that seem to delight in the darkness. Many of them are species of such a nature that apparently they can not exist in full sunlight.

The understory is composed very largely of palms, and of these the most abundant and conspicuous is the cohune or corozo (*Attalea cohune*), which here attains its best development. There are cohunes also in the lowlands, even in rather swampy ground, but they are most plentiful on the lower hill slopes. When this forest is viewed from a distance, the cohunes are not at all or scarcely visible, their foliage being concealed by the taller trees under which they grow. On the slopes they stand closely together and very successfully shut out what light filters through the trees above. Their huge leaves, frequently 30 feet long, wither after they fall to the ground and make a thick mulch over it. The nuts germinate freely and form vigorous beds of seedlings.

Other palms, but lower ones, grow with the cohune. The most noticeable is the lancetilla (*Astrocaryum cohune*), with its offensively armed stems, which has given the name to the valley. There are also *Bactris* species, two handsome Geonomas, and several graceful species of *Chamaedorea*. One of the neatest of the palms found in such situations is *Malortiea gracilis*. It is certain to attract attention because of its airy habit and especially on account of its cross-shaped leaves with rows of perforations or "windows" close to the midrib. A palm of less admirable characteristics is the balaire (*Desmoncus*). It is a clambering vine, and possesses pinnate leaves whose midrib is prolonged and whiplike and provided with abruptly refracted spines. These tips grope blindly in all directions, and grip any passing object, ripping it mercilessly.

The forest understory includes a fair variety of other trees than palms. There is the fine yucca-like *Dracaena*, with long grasslike leaves. It has a strange exotic appearance, and naturally enough, for it is the only American *Dracaena*, the others being chiefly African. *Guatteria amplifolia* grows at intervals in the forest, and *Mollinedia Butleriana* is common. *Quararibea Fieldii* is a frequent tree, noteworthy for its odor of slippery elm. It is interesting to find here cacao, apparently quite wild, in association with wild sapotes and avocados. A tree violet, *Rinorea guatemalensis*, demands attention, and there are small trees of *Xylosma sylvicola*, their trunks freely armed with branched thorns. *Carpotroche* is noticed because of its brightly colored, ball-like, winged fruits, set closely against the

trunk. Another prominent tree is *Pentagonia*, with its ungainly branches and bunches of huge leaves, in contrast with the bright red flowers clustered at their bases.

Of shrubs there is likewise a good variety, but chiefly rather inconspicuous ones. *Heisteria* is rather handsome because of the round, saucer-shaped, red calyx in which sits a contrasting black drupe. Several melastomes like the deep shade, notably *Tococa grandifolia*, with large leaves of a particularly fine tint of green, and small but pretty flowers.

The herbaceous plants of the heavy forest are notable more for the number of individuals than for variety of species. Certain to receive notice is the bright *Aphelandra aurantiaca*, with green-bracted spikes of fiery red flowers. *Begonia Popenoei* grows on moist banks, readily associated by the non-botanist with the familiar begonias grown as pot plants in the North. Two broad-leaved grasses, *Pharus glaber* and *Streptochaeta*, are a welcome variation from the monotony of the usual weedy tropical grasses. In low places in the forest, especially along streams, there are often great clumps of certain plants that have an important part in giving to the undergrowth of the tropical forest its distinctive aspect. These are the Heliconias, relatives of the banana, with canna-like leaves and brightly colored, red, orange, and yellow inflorescences with long, narrow, spreading bracts. Then there are the Calatheas, with similar leaves but compact bracted heads; and the *Costus* species, with thick stems, spirally disposed leaves, and bright, bracted heads.

Under the densest of the cohunes, where the ground is covered with rotting leaves, there are very few herbaceous plants. It is here that one may stumble rather by accident than design upon several small and very inconspicuous saprophytic plants. The most plentiful is *Sciaphila*, which may be found almost anywhere if one bends closely over the ground. The wiry, reddish stems and the minute flowers blend so thoroughly with the background that the plants are scarcely discernible when one is standing. *Gymnosiphon* (Burmanniaceae) and *Leiphaimos parasiticus* are more readily visible, but both are rare. The latter is a curious tropical representative of the gentians. Although these two plants belong to widely separated families, they are confusingly similar in appearance.

On only one occasion did I find the fourth of these saprophytic plants, *Helosis*. The individual plants, until inspected closely, appeared like mushrooms past their prime, and formed small clumps after the manner of certain fungi.

In the hill forest the cohune palms form a conspicuous belt of vegetation which has a rather definite limit. The cohunes end abruptly at an elevation of about 200 meters, and the forest above them assumes a slightly different aspect. Along this particular trail which we are following, shortly before the cohunes end, there occur small patches of silk-grass (*Ananas magdalenae*). This plant seems slightly out of place here, for in Panama, where it is more abundant, it grows in alluvial soil along streams in the forest. As a matter of fact, soil conditions here probably are essentially the same.

Above the cohune belt the forest is much more attractive because of its openness. It is possible in some places to see much farther, and it is easier here to traverse the forest if there is no trail to follow. The trees appear to be of much the same species, but I think they average considerably lower. There is a much more conspicuous understory of dicotyledonous trees, and a much greater variety of shrubs. *Trophis chorizantha* is a frequent small tree at this elevation, and another is *Lunania piperoides*, with its strange whitish inflorescences. Slender shrubby Pipers are frequent in these woods, and various bushy Rubiaceae, all much alike to the view of the uninitiated, but really remarkably diverse when inspected critically. The low, almost herbaceous *Psychotria uliginosa*, with large fleshy leaves, pale underneath, and stalked clusters of bright red berries, is a handsome plant. So, too, is the shrub or slender tree, *Myginda eucymosa*, with plum-like, cherry-red fruits. *Guarea bijuga* and *Siparuna Tonduziana* are occasional shrubs.

As we climb upward, over the continued steep trails, especially near the tops of the hills, we note that epiphytes are much more abundant and more accessible upon the smaller trees. During the rainy season nearly always there are clouds hanging about this belt of forest, and it is evident that it is kept constantly dripping wet. Upon the branches there are dense colonies of filmy ferns and other small species, small orchids, and a luxuriant covering of mosses, lichens, and hepatics.

Toward the tops of the hills there are no regular trails, and it is necessary to follow paths made by peccaries and other animals. The undergrowth is only moderately dense, and no great amount of cutting with the machete is necessary to pick a way through the forest.

Reaching the top of the ridge, it is possible to follow along the summit for a long distance, climbing and descending but little, for all of these hills seem to be connected as a sort of knife-edge ridge on each side of Lancetilla Valley. The vegetation on the summits of the

hills differs but little in respect to species from that occurring anywhere above the cohune belt, but there is an occasional distinctive plant. Only here did I find a strange melastome, *Maieta setosa*, its thick branches densely beset with needle-like hairs, its petioles with two inflated pouchlike appendages, perhaps for the shelter of ants. Here only did I see a handsome cycad, *Zamia Tuerckheimii*. It is only on these ridge summits that there grows one of the finest palms of the region, the palmiche, still but imperfectly known, although apparently a species of *Iriartea*. Its trunk is supported at the base by rigid, steel-hard prop roots. Slender and smooth, it rises straight in the air, to terminate high above in a graceful crown of plumelike leaves.

The monotony of collecting in these upper forests is broken now and then by finding small openings in the forest where trees have fallen some time before. Through the hole thus formed in the forest roof the sun slants downward, and favors the development of a few plants that really do not belong here. A recently fallen tree often affords a good collecting ground, with orchids and many other epiphytes. Unfortunately, unless in a well shaded situation, the epiphytes upon felled trees wither almost as soon as the foliage of the tree itself.

Between most of the hills there are small streams, but their banks yield few plants that do not occur farther up the slopes. A terrestrial *Carludovica* and a few ferns are confined to the rocks exposed by these mountain streams. When the streams are large enough to have a small amount of alluvial soil along their beds, the plants are more varied. In such places there grow various Acanthaceae, a few Rubiaceae, and conspicuous individuals of the genera *Heliconia*, *Renealmia*, and *Costus*.

STREAM BANKS

Lancetilla Station is situated at the very foot of the hills. Going northward toward Tela, the valley gradually widens, although even at its mouth it has no very considerable width. All the original vegetation of the valley floor has been destroyed, and most of that on the lower hills. Along the river, however, there is a belt of swampy ground, overflowed when the river rises, which has a plant covering much like that to be found in the wooded swamps near the coast.

The rather scattered trees in this particular place are mostly common and uninteresting species. Ochromas and guarumos are the most characteristic, and mixed with them are numerous young trees

of the tambor or *Schizolobium*. The immature trees of this species are very unlike the adult ones in general appearance. The older trees growing in the forest have no special character to distinguish them except their bright yellow blossoms, which are gaudy enough in their brief season. The young trees, however, are attractive and rather graceful, tall and either simple or with only a few thick branches. These terminate in a broad, feathery cluster of huge leaves so much divided that they remind one inevitably of the fronds of tree ferns.

One of the most abundant trees along the river, growing not only on its banks but also some distance back from them, is the sauce or Central American willow (*Salix chilensis*). In many parts of Central America this tree evidently is introduced, but here it has every appearance of being native, although possibly it was imported and planted by the aborigines hundreds of years ago. It is very conspicuous on account of its flexible, drooping branches and because of the color of its foliage, of a paler and much livelier green than is usual in tropical trees.

Another prominent tree along the river is the native bamboo, *Guadua aculeata*, which towers above most of its companions with its feathery plumes. The most conspicuous element of the herbaceous vegetation is *Calathea lutea*, a coarse plant two meters high or more, with huge, thin, vertical leaves, white on the lower side, that are so stiff that they rustle in the wind like sheets of paper.

SEASHORE

Tela lies on the seashore, the homes of the many employes of the Tela Railroad Company being built among the coconut trees that grow abundantly near the beach. Some years ago an extensive plantation of coconut trees was made here, and these palms are the remnants of them. It is a delightful place in which to live, just beyond the reach of the pounding surf, always considerable here, with a pleasant breeze nearly always blowing.

Like all beaches, this one, although not so picturesque as some, is a pleasant place along which to walk. At low tide the moist, firmly packed sand is the road traveled by the Caribs to their near-by settlements. The rubbish deposited at the limit of the high tide is a fascinating place in which to search for botanical relics, and one may discover mementos of the vegetation of the whole Central American coast. Palm seeds seem to predominate, among them representatives of certain species that I did not find growing near Tela. There are

quantities of *Pterocarpus* seeds, stones of the hogplum or *Spondias*, and the usual sea beans, the seeds of Mucunas, Caesalpinias, and Entadas. A good many acorns may be found, and it is puzzling to guess their source, for no oak trees grow close to the coast in this part of Central America. Probably these were brought from far inland by some river, possibly the Ulua. The most remarkable find was a single stone of the fruit of a species of *Calatola*,[1] a genus known at present on the one side from Mexico and on the other from Costa Rica. Such curious objects as an occasional parsnip or a spike of timothy may be explained as refuse from ships anchored close by.

Of the marine vegetation little is known. As has been found to be the case in the Canal Zone, seaweeds probably do not abound in the ocean here, but a few coarse ones are cast up by the waves. Leaves and stems of *Zostera* and *Ruppia* generally accompany them.

The vegetation of the beach is what one would expect in such a situation. The plants of sea beaches are much the same throughout tropical America, and as far northward as Florida. Indeed, they exhibit a certain uniformity over widely separated parts of the earth. Most abundant and conspicuous, perhaps, are the goatfoot morning-glory (*Ipomoea Pes-caprae*) and *Canavalia maritima*, both of which have coarse, ropelike, creeping stems several meters long. *Remirea guianensis* grows in small tufts in the loose sand, with *Croton maritimus* and various other plants. Another morning-glory, *Ipomoea stolonifera*, with reduced leaves and flowers, often is plentiful. Common beach grasses are the vile sandburs (*Cenchrus* spp.), *Chloris petraea*, and *Stenotaphrum*. Other plants thriving in the sand are *Cakile*, *Vigna repens* with long prostrate stems and yellow beanlike blossoms, a spurge (*Euphorbia ammannioides*), a weedy yellow-flowered mallow (*Sida cordifolia*) and the similar *Waltheria americana*, *Lippia nodiflora*, the blue-flowered *Stachytarpheta jamaicensis*, *Diodia maritima*, and a white-flowered composite, *Melanthera nivea*.

Where there are small level places from which the salt water drains slowly, often there are extensive colonies of salt-tolerant grasses and sedges. Just back of the beach are dense thickets, rather narrow as a rule, composed of shrubs commonly found in such places. One of the most abundant here is the coco-plum (*Chrysobalanus Icaco*), a scrubby bush whose oddly colored but not too agreeably flavored fruits are esteemed only by children. A bright green, sticky bush, *Dodonaea viscosa*, with winged fruits suggestive of those of northern hop-bush (*Ptelea*) is prominent in these thickets, with such Rubiaceae

[1] Contr. U. S. Nat. Herb. 23: 688. 1923.

as the spiny *Randia armata; Alibertia* with its white flowers and dense, shining foliage; and *Chiococca,* with drooping racemes of compressed, pure white berries. The seagrape (*Coccoloba Uvifera*) is confined to the edge of the beach. It is an exceptionally handsome shrub, with its dense growth of thick, round leaves, often brightly tinted with red and pink.

Covering flat places close to the beach that are covered with salt water at high tide there is a distinct association of plants. The chief species are a grass, *Sporobolus littoralis,* and several sedges—*Fimbristylis spadicea* and *F. spathacea,* and *Kyllinga peruviana* and *K. pungens.* In such places there sprawl over the ground the crisp, succulent stems of *Sesuvium Portulacastrum,* and the less fleshy stems of an amaranth, *Philoxerus,* creep along the soil.

If there are long, narrow lagoons behind the beach, or if the sandy beach is lacking, the water is bordered by thickets of mangroves, lifted high above the mud on their stilt roots. Strangely enough, I did not observe the black mangrove (*Avicennia*), almost omnipresent in such situations, but it must occur not far away. The thickets consist chiefly of the common mangrove (*Rhizophora*) and its classic companions, button mangrove (*Conocarpus*) and *Laguncularia.* Associated with them are such shrubs and small trees as *Dalbergia Brownei, Hibiscus tiliaceus* with wide, green and red flowers like hollyhocks, *Pavonia spicata, Cassipourea,* and the spiny bully-tree (*Bucida*).

These salt thickets extend inland for a short distance along the sluggish streams. In other thickets close at hand, but in soil less brackish, there is a tangle of such shrubs or trees as *Lacistema;* the spiny *Ximenia* with small, bearded, white flowers and yellow, plum-like fruits; bayberry (*Myrica cerifera*); *Coccoloba barbadensis,* and *C. acuminata* with bright red berries; the pond-apple (*Annona glabra*) and its relative, *Sapranthus campechianus,* with purple-brown, carrion-scented flowers; *Hirtella americana* and *H. guatemalensis; Trichilia havanensis;* the nance (*Byrsonima*), with golden flower spikes and pale yellow, edible fruits; *Casearia aculeata* and *C. javitensis; Psychotria Oerstediana;* and *Morinda panamensis.*

WOODED SWAMPS

East of Tela in the extensive swamps, heavily wooded, where the tide rises and falls, *Pterocarpus belizensis* seems to be the dominant tree. Its fallen one-seeded pods often cover the surface of the black water. A spiny palm, *Bactris minor,* grows in huge clumps, and forms quite impenetrable thickets. The coarse, 4-sided, prickly

stems of sarsaparilla (*Smilax ornata*) climb high on the trees. In openings a coarse but ornamental aroid, *Montrichardia*, rises on stilts from the ooze, or the beefsteak heliconia (*Heliconia Mariae*) forms rank herbaceous thickets as tall as banana plants. The huge, ungainly, pendent, sanguine flower spikes of this greatest of Central American herbs inevitably suggest its common name.

Westward from Tela there are many more of these wooded swamps, alternating with banana plantations and pastures. They are so thickly grown and contain so much water that they are all but impossible of access unless lines have been cut through them, or they have been drained preparatory to cultivation. Along their borders there is excellent collecting, for here many small trees and shrubs find their most congenial habitat. Within the swamps themselves one is likely to be disappointed, because there are comparatively few herbaceous or shrubby plants that tolerate the deep shade, and the taller trees are inaccessible.

Ingas luxuriate in these swamps, at least at their edges, and there are many species of them. Their flowers always are conspicuous because of their profusion of long, white stamens. Other leguminous trees that frequent the swamp forest are *Pithecolobium longifolium*, which prefers the banks of slow streams; *Cynometra retusa*, easily placed by its two large leaflets; the bright-flowered *Lonchocarpus* species, slightly suggestive of black locust, with which they are allied; and *Dalbergia monetaria*. Some swamps are almost monopolized by *Erythrina glauca*, a beautiful but useless tree, which blazes in spring with great clusters of orange blossoms.

Other swamp trees are *Licania hypoleuca*, and *L. platypus*, called here urraco, whose long, narrow leaves are of a peculiarly fine shade of green, and often richly bronzed when first they unfold; *Alchornea latifolia* and *Omphalea diandra*, of the Euphorbiaceae; *Symphonia; Oncoba laurina;* and *Gustavia integrifolia*, with few heavy branches tipped with clusters of large but narrow leaves. Coarse lianas reach their best development where there is an abundance of water. They are represented here by *Cnestidium* with its brown-velvety leaves; the giant Entadas with their huge pods; *Mucuna rostrata*, whose pods and clusters of flowers depend on long cordlike peduncles dangling from far overhead; *Hippocratea volubilis* with depressed, deeply 3-lobed pods; *Combretum coccineum*, gorgeous in spring with spirelike spikes of fiery red blossoms; and the golden-flowered *Allamanda*, with prickly pods. Among the shrubs there is *Bunchosia nitida*, with yellow flowers and red berries; and *Mouriria parvifolia*, a melastome,

although one never would guess the relationship from the leaves. Only rarely does one find here *Cephaelis tomentosa*, a shrub common in many parts of the Atlantic coast, and always noticed because of the vivid red bracts subtending the heads of yellow flowers or blue berries. One of the handsomest of the local shrubs is *Miconia oinochrophylla*, in which, as its specific name implies, the leaves are richly colored beneath with wine red. It is in such swamps as these that one comes upon *Begonia glabra*, a widespread species, but always interesting because of its vine habit, the succulent stems adhering tightly to tree trunks by their myriads of rootlets.

The dark, heavily wooded swamps are alluring places in which to collect, for there is an ever present hope, bred from past experience, of finding some quite new or curious plant. The only drawback to this exploration, aside from the uncertain footing, is the myriad swarms of mosquitoes that invariably infest their heavy shade. When every exposed or thinly clad portion of one's body is peppered with the stabs of these persistent creatures, the only solace is remembrance of the fact that these are not malarial mosquitoes. These insects, along with chiggers or redbugs, and the usually much less troublesome ticks, are annoyances that must be endured and as cheerfully as possible ignored by those who insist on walking in lowland tropical woodlands.

MARSHES

Still farther westward from Tela, shortly before the valley of the Ulua River (claimed, as usual, as the largest river of Central America) is reached, stretch extensive marshes and open swamps. One's eye is attracted at once by the abundance of bird life. Birds breed here by the millions, safe from most of their enemies, and their numbers are increased at the proper season by flocks of migrating ducks and other water fowl.

The marshes consist of broad, shallow lakes interspersed with small, irregular islands of aquatic vegetation. Here grow cat-tails (*Typha*) and coarse grasses, such as wild rice (*Oryza latifolia*), *Panicum grande*, reeds (*Phragmites*) with feathery, purple plumes, and *Tripsacum laxum*. A tall sedge (*Cyperus giganteus*) resembles closely the papyrus of the Nile. A beautiful half-shrubby *Hibiscus* (*H. Lambertianus*) abounds in the Toloa Swamp, its wide flowers delicately colored in pink. *Thalia* forms vast colonies in the marshes, its great, stiff, canna-like leaves rustling in every breeze, or beneath the feet of birds that alight upon the stems.

Some of the marsh plants are immediately familiar to a northern visitor. There are arrow-heads (*Sagittaria*), with arrow-shaped leaves and fragile white flowers; pickerel-weed (*Pontederia*), with purple spikes; *Heteranthera reniformis;* and smartweed (*Polygonum*). Other common herbaceous plants are *Echinodorus,* which resembles the arrow-head in flower and habit; *Aeschynomene sensitiva,* and *Sphenoclea zeylandica,* a curious plant of no easily visible affinities, whose determination is likely to worry even a botanist. A characteristic marsh shrub is the prickly *Mimosa pigra,* with compact spikes of pink flowers. It is in the marshes that one sees most frequently the paradoxical provision tree (*Pachira aquatica*), whose clumsy branches appear altogether inadequate to support their inordinate burden of heavy fruits.

The quiet water of the marshes usually supports a rich flora of floating plants. Water lettuce (*Pistia*), with its neat rosette of spongy leaves that it is hard to associate with the arum family, covers the water solidly in places. Almost equally prolific is *Salvinia,* which sometimes is piled by the wind in heaps along the shore. Other floating plants of more or less abundance are *Azolla,* duckweed (*Lemna* and *Spirodela*), *Jussiaea natans,* and waterlilies (*Nymphaea*).

In the lower land near the swamps there are many fine individuals of the stately cabbage palm (*Oreodoxa*), which seems not to extend far inland. Cohune palms are everywhere.

The open marshes extend all along the lower valley of the Ulua. Where not quite so low, most of the area is planted with bananas, for it is here that the best banana land is found.

PROGRESO REGION

The region about Progreso, the largest inland settlement of the Tela region, is decidedly different in topography because of its proximity to the first of the higher mountains of the interior. Its climate also is substantially different, the rainfall being much less than at Tela, and the heat more intense, especially in the dry season.

Among the trees growing about Progreso are various species that apparently do not extend to the coast, and some of them recall the flora of the Pacific slope of Central America. They include such trees as the castaño (*Sterculia apetala*), ear-tree or guanacaste (*Enterolobium*), *Sparattanthelium, Albizzia adinocephala, Colubrina rufa, Muntingia, Guazuma,* and *Calycophyllum.* Especially familiar to one who knows the dry Pacific slope is an old friend, *Cordia alba,*

which grows there in such monotonous abundance. There appear here, likewise, several new shrubs, such as *Clematis dioica, Calliandra confusa* and *C. yoroensis,* the gaudy-flowered *Cassia biflora, Benthamantha mollis, Acalypha villosa, Croton ciliato-glandulosus, Gouania eurycarpa* and *G. lupuloides, Rauwolfia canescens,* and *Vernonia patens.* Even among the herbaceous plants there are additions, like *Portulaca pilosa, Stylosanthes humilis, Dalechampia scandens, Euphorbia graminea, Tragia volubilis, Melochia lupulina,* and the stinging *Gronovia scandens.* Practically all these plants are seen more frequently on the Pacific slope of Central America than on the Atlantic, and they are characteristic of a drier climate than that of Lancetilla.

Progreso lies close to the mountains of the interior. I did not visit the hills nearest the town, which undoubtedly would have added many species to the present list.

EPIPHYTES

An important and characteristic element of the Lancetilla flora consists of the epiphytes that play so important a role in tropical vegetation generally. Many of the trees in the forest are laden with epiphytes of great diversity in habit and relationship, but these plants are not so abundant here as in some other parts of Central America. Nowhere, probably, do they attain such lavish development as in the higher mountains of Costa Rica, where every tree is covered with ferns, orchids, aroids, bromeliads, Ericaceae, Gesneriaceae, and many other groups, and festooned with mosses and hepatics.

In the Tela region there are several trees which begin life as epiphytes, and often continue that habit of growth nearly or quite throughout their life. Typical and most abundant of such trees are the wild figs (*Ficus* spp.). Their seeds germinate on some high branch, and the young plant develops slender cordlike roots that descend the parent trunk to the ground. The roots increase in number and size, forming a network that closely embraces and finally strangles the host plant.

Most of the fig trees in time become large, independent trees that often have huge trunks. A few species seem always to be epiphytic, and never attain a great size. The Coussapoas nearly always are seen as epiphytes, and although they may attain considerable size, usually they do not kill the host but grow side by side with it. The Clusias have a similar life history.

There are epiphytic shrubs of diverse families. They include the strange *Marcgravia,* which grows as a great vine, *Souroubea* of the

same family (Marcgraviaceae), *Adelobotrys* among the melastomes, *Codonanthe* and the red-flowered Columneas of the Gesneriaceae, *Hillia tetrandra* among the Rubiaceae, and representatives of two genera of composites, *Liabum* and *Eupatorium araliaefolium*.

The shrubby plants of the mistletoe family (Loranthaceae) are parasites rather than epiphytes, although often they grow in association with the latter. Another parasite of the region is the herbaceous dodder (*Cuscuta*).

There are three or four families of herbaceous plants in which epiphytes predominate. The aroids compose a very large proportion of the mass of epiphytic vegetation. Some of them, like the Monsteras and species of *Philodendron* and *Syngonium*, are large, coarse vines. The Monsteras especially always attract attention from strangers because of the large perforations in their leaves. *Philodendron radiatum*, with huge, deeply cut leaves, also is a conspicuous plant. The Anthuriums usually are small and relatively slender plants, although a few of them are vinelike in habit.

Nearly all the bromeliads (plants of the pineapple family) are epiphytes. They are represented here by several species of the vast group *Tillandsia*, and by members of the genera *Aechmea*, *Catopsis*, and *Vriesea*. Many of them have very handsome and showy inflorescences. Their enlarged leaf bases hold water in which insects breed and other animals find a congenial home. It is a remarkable fact that this great family is confined to the American tropics.

The group to which one's thought inevitably turns when epiphytes are mentioned is the orchid family. A large number of orchids, of course, are terrestrial plants, and a few such species grow in the Lancetilla region. Most tropical orchids, however, are perched upon branches or cling to the trunks of trees. Orchids are fairly plentiful on the Honduran coast, but most of them, as is usually the case, are small plants with insignificant flowers. They grow ordinarily so high on the trees that they are out of sight, and about Lancetilla the number of individuals is small in comparison with what may be found in the mountains of Panama or Costa Rica. The local species include some Sobralias and Epidendrums with handsome blossoms, neat plants of the genus *Dichaea*, the odd bird-head orchids (*Ornithocephalus*), and vanilla.

Other epiphytes are the Peperomias, of the pepper family. The genus *Peperomia* is a large one in Central America. It consists of very succulent, brittle herbs, practically all of which are epiphytes. The

only other Central American genus of the family, *Piper*, on the other hand, consists of shrubs, nearly all of them terrestrial in habit.

One other group of plants of the Tela region is prevailingly epiphytic, the cactuses. They include species of *Epiphyllum* and *Rhipsalis*, or mistletoe cactus. In arid regions, as is well known, cactuses grow in soil, but in the humid tropics the plants have assumed the arboreal habitat, and are associated with orchids, ferns, and mosses.

WEEDS

To the botanist weeds are plants to be abhorred because they occupy space that might be filled more profitably by more interesting vegetation. In the strictest sense of the word, a weed is a plant growing where it ought not to be. The only real weeds, I presume, are plants growing in cultivated ground and competing unfairly with useful plants, but, in the sense employed here, a weed is a plant, usually herbaceous but often shrubby and sometimes even a tree, which occurs in tiresome abundance in cultivated ground, abandoned fields, about dwellings, or along roads. Our herbaria are filled with specimens of them, brought back from the tropics by inexperienced and too enthusiastic—or gullible—botanists.

Most weeds are of little or no interest to the systematic botanist and, if gathered at all, are taken only to complete the record of the flora of a region. They are of little significance in studying the vegetation of an area, because they occur only under artificial conditions. Very often they are or have the appearance of being introduced, and therefore are alien plants.

It is interesting to observe the weeds that spring up in new clearings in recently occupied regions. At first there are no introduced weeds. I have studied such places particularly in Florida, New Mexico, and Central America. In the first plantings made in these places the stirred soil is invaded by native species, which grow somewhat more luxuriantly than is their wont when in closer competition with their customary associates. With such conditions the collector often finds an ideal collecting ground in cultivated places. But after a few years seeds of alien plants are introduced with planted seeds, and by other means, and the less resistant native species are crowded out.

In Central America there is a large number of weedy plants that grow almost everywhere except in virgin forest and savanna. Almost all of them are American in origin, but since they never or very

seldom are found in virgin land, and even then with the appearance of casual introductions, one can but wonder where they may have grown when the whole American continent was free of human inhabitants. If a region in Central America were abandoned for a few centuries by man, it is probable that most of these plants would disappear. Surely their present abundance, vigor, and diversity must be the result of a very long association with the human race.

Perhaps it is worth while to list here the most common weedy plants of the Lancetilla region. They include most of the commonest weeds of Central America, and of tropical America generally. If every collector who works in tropical America would carry this list into the field with the firm resolution never to collect a specimen of any species that it includes, he would attain merit with all the larger herbaria, whose space already is cluttered with a disproportionate number of specimens of such plants. These species seem to possess a fatal attraction for the undiscriminating novice, who delights in increasing his collections by their repeated inclusion.

The following weeds all are presumed to be of American origin. The species starred are ones that are even more excessively abundant than the others. The list could be increased by dozens of other species almost as plentiful as those cited.

Axonopus compressus
**Digitaria sanguinalis*
Echinochloa colonum
**Eragrostis ciliaris*
Oplismenus hirtellus
**Panicum barbinode*
**Panicum maximum*
**Panicum trichoides*
Paspalum paniculatum
**Setaria geniculata*
**Cyperus ferax*
Fimbristylis diphylla
Scleria melaleuca
Commelina elegans
Commelina longicaulis
Piper peltatum
Alternanthera sessilis
**Amaranthus dubius*
**Amaranthus spinosus*
**Chamissoa altissima*
Cyathula achyranthoides
Gomphrena dispersa
**Iresine Celosia*
**Boerhaavia caribaea*
Boerhaavia erecta
**Petiveria alliacea*
Rivina humilis
**Drymaria cordata*
**Mimosa pudica*
Cassia occidentalis
Crotalaria incana
Crotalaria retusa
**Indigofera suffruticosa*
**Indigofera mucronata*
**Aeschynomene americana*
Desmodium adscendens
Desmodium frutescens
**Desmodium Scorpiurus*
Desmodium triflorum
Phaseolus lunatus
**Euphorbia brasiliensis*
**Euphorbia hirta*
**Euphorbia hypericifolia*
Phyllanthus Niruri
**Triumfetta Lappula*
**Pavonia rosea*
**Sida acuta*
**Sida rhombifolia*
Cuphea carthagenensis
**Jussiaea suffruticosa*
Spigelia Humboldtiana
**Asclepias curassavica*

Ipomoea polyanthes
Heliotropium indicum
**Priva lappulacea*
Hyptis capitata
**Salvia occidentalis*
Solanum nigrum
**Scoparia dulcis*
**Blechum pyramidatum*
Mitracarpus hirtus
Richardia scabra
Hemidiodia ocimifolia
**Borreria laevis*
**Borreria ocimoides*
Melothria guadalupensis
**Momordica Charantia*
**Pseudelephantopus spicatus*
Ageratum conyzoides
**Mikania micrantha*
Baltimora recta
**Eclipta alba*
**Melanthera aspera*
**Bidens pilosa*
**Tridax procumbens*
Neurolaena lobata
Erechtites hieracifolia

The introduced weeds of Central America, at least those recognizable as such, are usually few in number. At this date, 400 years after the first settlement of European people in Central America, it is almost impossible to determine which weeds are adventive in any given locality and which native. Many tropical weeds are cosmopolitan in distribution, and it is probable that the history of few of them is so well authenticated that their original habitat can be stated with any degree of confidence, even by those who write with the greatest pretense of authority upon the subject.

The following are some of the few plants presumed to be adventive in the Lancetilla region:

Coix Lachryma-jobi
Cymbopogon citratus
Cynodon Dactylon
Dactyloctenium aegyptium
Eleusine indica
Rumex crispus
Achyranthes aspera
Achyranthes indica
Amaranthus gracilis
Mirabilis Jalapa
Nasturtium portoricense
Bryophyllum pinnatum
Ricinus communis
Lochnera rosea
Emilia sonchifolia

All of these except two are claimed to be of Old World origin. *Mirabilis Jalapa* is clearly American, but apparently it is found no longer as a truly wild plant. It is one of a considerable number of ornamental or edible plants long grown in American gardens whose exact native habitat is and doubtless always will be obscure. *Nasturtium portoricense* grew where it bore every appearance of being an introduced plant. If the plants are correctly identified, perhaps they came originally from the Antilles. The species is reported to be a native of Porto Rico, but one familiar with the systematic botany of tropical America, and especially with the Cruciferae, even without detailed knowledge of Porto Rican vegetation, must look with skepticism upon the statement that it is native in the West Indies.

Cymbopogon, Bryophyllum, Ricinus, and *Lochnera* evidently are escapes from cultivation. Of *Rumex crispus* only a few plants were found in a horse corral, where their occurrence was accidental and will not long continue. The other Old World species enumerated probably were casual introductions that obtained a foothold hundreds of years ago.

RELATIONSHIPS OF THE FLORA

If any one has occasion to study the distributional data of the species listed from the Lancetilla region he will be impressed by the monotonous repetition of the phrase "widely distributed in tropical America." It is of such plants that the flora of the Central American coast principally consists. This same flora ranges from Veracruz in Mexico southward along the whole Atlantic coast of Central America to the humid portions of northern Colombia. Very similar is the flora of the Guianas, and I have been much impressed recently, while studying large collections made along the Amazon River as far westward as Iquitos, Peru, by the similarity also of the Amazonian flora. The same genera occur in the Amazon Valley, and many of the same species.

Nevertheless, one who collects here and there along the Central American *tierra caliente* will not find its flora too monotonous, unless too much time is devoted to the region. In every locality there occur interesting plants not observed elsewhere. The percentage of such apparent endemics is small, it must be admitted, but it does exist. Every now and then one finds species far distant from their recorded range. Unexpected genera make their appearance, often a thousand miles from their nearest known occurrence. The discovery in the Tela region of the genus *Zollernia,* hitherto supposed to be restricted to Brazil, is an instance of this sort; also the finding here of *Dicraspidia,* an abnormal genus of the Tiliaceae, recently described from Costa Rica and Panama.

Zollernia was found at about the same time in British Honduras. That country, more than any other of Central America, perhaps, has yielded surprising records of this sort. It is almost certain that some of these South American genera and species now known in North America only from British Honduras will be discovered sooner or later in intervening regions, but the fact is that up to the present time they have not been found in them.

The physiography of most of the Atlantic coast of Central America is fairly uniform, affording everywhere the same alternation

of open swamps, swampy forest, and densely forested hills whose slopes in wet weather are slippery beds of tenacious red clay. The forest looks much the same, wherever you go, but when the species of trees and of the undergrowth are studied, there are sensible variations. In Costa Rica localities but ten miles apart may have quite different species of plants in the undergrowth. One striking plant abundant in a certain spot may not be found at all only five miles away.

The vegetation of the Tela region seems to me to be much more uniform than that of the Costa Rican lowlands, perhaps because I have spent so much more time collecting in the former. About Lancetilla, unless a locality with different soil or climate is visited, the flora seems to be rather constant.

The dominant trees here are *Brosimum* and *Dialium*, just as at a similar elevation in Guatemala, but you miss here the *Manicaria* swamps so conspicuous about Puerto Barrios, Guatemala. I presume that they do occur not far from Tela, but I did not see them. Not far inland in Guatemala pine trees make their appearance on the low hills whose slopes have much less elevation than the hills of Lancetilla. In Honduras, in order to find pines, you must go far inland, into a much drier region than that of Lancetilla. In some parts of the Central American coast, as in British Honduras and Nicaragua, pine trees come quite to the seashore.

About Tela one misses the profusion of Rubiaceae, Acanthaceae, and Myrsinaceae that abound in the lowlands of Costa Rica, nor do you find here the Lecythidaceae and Theobromas so conspicuous there. The Tela region looks very much like that of the Canal Zone, yet a surprising number of the trees and smaller plants are different in the two areas. *Miconia argentea*, so much in evidence on the shores of Gatún Lake, is scarce about Tela, and many other trees conspicuous and abundant in one or the other of the two regions are rare in the other or altogether absent. The distribution of species along the Atlantic coast seems so erratic that one is inclined to believe it chiefly a matter of chance.

Taking all its elements into consideration, it may be stated that the flora of the Lancetilla Valley and its environs is about the average of that general along the Caribbean shore. It contains some local elements, but most of its species will be familiar to one who knows well either Panama, Costa Rica, or Guatemala. Its flora is, of course, very different from that prevailing on the much drier Pacific coast, and from that found in the mountains of the interior of Honduras.

ECONOMIC PLANTS

On the following pages, besides the native or accidentally introduced flora, there have been listed all the economic and ornamental plants observed in the Tela region. These form quite as important a part of the collective flora, or at least they are fully as important to the residents in the region, as any of the native plants. To a visitor, moreover, especially to one not previously acquainted with the tropics, the cultivated plants, nearly all of them new to him, will prove of paramount interest.

Most of the edible plants growing under cultivation about Tela are listed here, but probably some of the uncommon fruits have been overlooked. It is certain that some of the ornamental plants have escaped mention, since no careful survey of them was undertaken. The Central American people generally, at least the women, are devoted to flowers, and poor is the home that does not boast a few plants tended for their flowers or foliage, planted in the dooryard or grown in pots in protected places. No time was available for visiting every house of Tela and the outlying country, where doubtless many other ornamental plants might have been discovered. The cultivated plants of Central America generally are somewhat limited in number, and one familiar with any part of the region seldom is surprised by novelty, except about the *fincas* of the rich.

The most important cultivated plant of the Tela region is the banana, which supplies the chief article of export from Honduras. No other country of Central America furnishes so large a crop of this Old World fruit for export. Without the banana Honduras would be poor indeed, for the time at least, since its coffee crop is small in comparison with what is produced in Guatemala, Salvador, Nicaragua, or Costa Rica. Coffee, of course, is grown for market only at higher elevations, usually at 2,000 feet or more, and comparatively little of Honduras' many square miles of elevated land probably is adapted to coffee culture.

As a local source of food, the most important crop is maize or Indian corn, which always, or at least for many centuries, has been the chief food staple of the more civilized inhabitants of Central America. It is grown abundantly in the Tela region, although obviously not on so large a scale in an area devoted primarily to the production of bananas. The other important food crops are beans and rice, after which follow sugar, and a host of minor vegetables such as yucca or cassava, yams, onions, garlic, tomatoes, cabbage, and others of less importance.

Fruits also are grown in considerable variety. Here in the banana country, where most of the land is owned and occupied by the banana companies, private holdings are few, and there is little incentive to the planting of fruit trees or to the growing of gardens. Most of the inhabitants, indeed, have no land for such a purpose, and no time to cultivate it if they had, and they depend for their supplies upon the local commissaries.

At Lancetilla Experiment Station there is planted the largest variety of foreign fruit trees to be found anywhere in the American tropics. Many of the best of these it is hoped will be established in the region and ultimately distributed over Central America. The plantations at Lancetilla are still young, and few of the trees are bearing. At one of the farms, Puerto Arturo, near Tela, many fruit trees were planted long ago, and are now producing, but they are chiefly the ordinary fruit trees of tropical America—oranges, grapefruit, mangoes, star-apples, and the like.

At some of the scattered *fincas* which still persist in the region, especially about Progreso, a greater variety of fruits is grown, and some of the less common ornamental plants are seen. The owners of small country places in Central America often take a keen delight in improving their land, and exhibit justifiable pride in some unusual fruit tree brought from the "interior," pointing to it as the only individual of its kind for miles about. Such isolated individuals ever furnish surprises for the botanist. Especially in the case of ornamental plants, one often is hard pressed to guess how a rare species may have reached its present growing place. On one occasion in Costa Rica I was shown by Mr. C. H. Lankester in the mountains on an abandoned house site a curious iridaceous plant, whose determination was a matter of much difficulty. It grew there as a large and increasing colony, but the plant had never been noted elsewhere in Costa Rica. It was an African species, unknown in cultivation in the United States. How and when had it reached this out-of-the-way spot?

The ordinary country house or manaca hut of the Honduran lowlands is an ephemeral structure. It may be occupied for several years, then be abandoned suddenly, with scant loss, for it represents a sale value of probably less than twenty-five dollars. Fruit trees and shrubbery planted about such a place often persist for many years, and when the sites are overgrown, as they quickly are with jungle, such plants have the appearance of accidental introductions. Few of them are able to reproduce themselves, a notable exception

being the mango, whose seeds, thrown anywhere along the roads and trails, spring up like weeds, to the later delectation of travelers.

We have very little dependable or credible evidence regarding the original habitats of the most common fruit trees and vegetables known to be native in America, nor are we likely ever to obtain much more than we have at present. The time for gathering illuminative data passed four centuries ago. The Spaniards must be credited with having done at least something for the betterment of their colonies, and they did take an interest in introducing new plants to improve the resources of their American possessions. If the plan was not instigated by governmental agencies and the introduction depended upon individual effort, certainly the collective results were rather imposing. There is reason to believe that immediately after the conquest of the tropical regions of North and South America plants were carried intentionally and more or less systematically from one region to another. There is today considerable doubt as to the direction in which some of these plants were transported, and their history will ever be a matter for speculation rather than demonstration. We can only surmise that the pineapple was brought from Brazil to the Antilles and to Mexico, but we are pretty certain that the native cherry was carried from Mexico to the Andes.

In the deep and primeval forest covering the steep clay hills above Lancetilla there grow wild three trees whose presence here is significant and offers an interesting subject for speculation. They are cacao, the hard-skinned avocado, and the sapote. All of these are plants that are cultivated throughout Central America, northward into Mexico, and even far southward in South America. Are they really native here, as they appear to be? If so, might this not indicate that this part of Honduras was an important center of population or of culture in early days, whence these plants were dispersed to distant regions? Certainly it is not easy to find all these plants growing together elsewhere in Central America with such an appearance of being in a truly wild state.

The forest of these hills has every evidence of being perfectly primeval. There are all the marks that are supposed to furnish reliable criteria upon this subject—giant forest trees in great variety, an abundance of corozos and other tall palms, and a great profusion of the more significant small palm species, tree ferns, and many other plants that never are known to exist in second-growth forest.

But what is primeval forest in Central America? Who knows? Upon the exposed slopes high up in this forest one sees abundant

shards, pieces of clay vessels now so soaked by the perennial rains that they may be crumbled like chalk between the fingers. Did the aborigines carry these scraps up here on the hills and scatter them about as part of some childish game? Is it unreasonable to suppose that hundreds of years ago these hills may have been cleared and planted with corn, just as they are being cleared today by the descendants of those aborigines? If these transient clearings are surrounded by virgin forest, will not the native plants at some time, after the clearings have been occupied by guamil, reseed them with forest species? Is it not possible that these cacao bushes and sapote and avocado trees are remnants of plantations of long ago? He is rash indeed who, remembering the long years that we know Central America has been inhabited, if we are to trust the almost unanimous opinion of archaeologists, ventures to state that these hills have never been planted with corn. There are mountain sides in Costa Rica which I should dare to maintain without fear of contradiction had never been tilled, because it is impossible to scale them, but I should not care to maintain the same thesis against an able cross-examiner with regard to the easily accessible slopes of these hills of the Honduran coast land.

Since most of the agricultural land in the Tela region is controlled by a company engaged in the production of bananas for export, it follows that other agricultural operations are limited in extent, and this, in fact, is the case in all the wet lowlands of the Central American coast. Throughout the Atlantic coast of Central America the area of land devoted to agriculture is very small, if we exclude banana plantations, and, if bananas were not grown, almost all the land would be covered with forest.

The large amount of timber wasted in clearing ground for agricultural purposes is to be deplored. Some of the best of the timber is utilized by the larger companies, but only a small proportion of the total. This waste is probably justified by the benefits resulting to the region from the extensive cultivation of bananas, sugar cane, cacao, and similar crops.

In the banana country there are occasional small or large tracts of land under private ownership. Some of the larger landholders grow bananas, which are sold to the large companies for export. Upon the smaller tracts there are grown vegetables, corn and rice, and fruits for the consumption of the owner or for sale locally. The amount of food thus produced is relatively small, and not nearly enough for the support of the workmen upon the banana plantations,

who consume much food imported from the United States. In Honduras better means of transportation to the interior (they are practically non-existent at present) would permit the production within the country of much of the vegetables and grain now imported. The importation into Central America from the United States of vegetables (except potatoes) and of fruits savors too much of the traditional transportation of coals to Newcastle.

Scattered throughout the banana country there are many squatters, mostly men who do not work for the larger companies, who settled few or many years ago upon the land, and who remain there until some higher power has reason for ejecting them. They pursue agricultural occupations in a rather desultory fashion, upon so limited a scale that one often wonders how they manage to exist. The amount of food produced upon their Lilliputian clearings is insignificant, but they grow a little corn, some beans, cassava, onions, tomatoes, and other products, eking out their livelihood by burning charcoal or working occasionally for hire.

These squatters practice the same agricultural methods that are followed in all parts of Central America where there is plenty of virgin forest. Going perhaps into the very heart of the forest, they fell with great labor all the tall trees and cut away the bushes and lianas. It is desirable to choose a slope, or else make a clearing large enough to permit free exposure to the sun, since, I am told, in a small clearing completely surrounded by tall trees crops do not thrive, and are likely to be attacked by all sorts of unforeseen pests.

As the trees are felled they fall in every direction, forming great heaps of logs over which one must climb like a monkey. After this cut vegetation has been allowed to dry as much as possible, it is fired. The larger trunks are not consumed but are left lying on the ground. Corn and beans then are planted among them and left to grow. The ground is not broken up nor are the plants cultivated, except that care is taken that they may not be altogether choked by the invading weeds. Upon such a piece of ground crops are planted only one or two years, then it is abandoned, and new land is cleared for planting. Such a system is a wasteful one and involves labor out of all proportion to the results obtained, but it appears to be necessary, since the ground is quickly exhausted.

In the Tela region such of the logs as are suitable for the purpose often are burned for charcoal, the fuel most used in native kitchens. Trees are cut, also, for this special purpose, to the further depletion

of the forest. Logs left upon the ground are attacked by fungi and by insects, and soon become a crumbling mass that quickly disintegrates. In clearing land for the commercial production of bananas, likewise, it is not considered necessary to burn the large logs, but they are left among the banana rows. By the time the first bananas are ready for cutting, the logs have rotted so much that they do not obstruct the harvest of the crop.

Disregarding what may have happened centuries ago, the Tela region has been settled only recently, and the ground but lately brought under cultivation. The best evidence of this fact is the small number of introduced weeds. Some of those listed here were found only about Lancetilla Station, where doubtless they had been introduced with the many importations of seeds and plants for cultivation.

Upon examining closely the following list of species, one will note the omission of several friends of the Central American lowlands. *Oplismenus Burmanni*, for instance, one of the common weedy grasses of banana plantations elsewhere, was not noted here, and there are other equally conspicuous omissions. More weeds were noted about Progreso, which is an older settlement than Tela.

VERNACULAR NAMES

The writer always has taken a profound interest in the collection of vernacular names applied to plants in Central America and has collected many thousands of them, from a large number of informants. There is still much to be learned in this branch of botanical work, and it is to be regretted that an ordinary collecting expedition does not afford as much time as one would wish for recording native names. They are of value only when recorded by one who has a rather thorough knowledge of Spanish and of vernacular names used in other regions of similar speech and flora. Even the best-informed person will find that he has made mistakes in recording and interpreting plant names, and sometimes quite ridiculous errors are made thus.

The names of very conspicuous or economically important plants are rather constant in Central America, not altogether so, by any means. The Spanish spoken in the various small republics of Central America varies in a fascinating but often bewildering manner, and the names of common everyday objects often change completely from one country to another. It is not surprising, therefore, that plant names also show great variation, yet in a given locality they

are ordinarily well fixed. How different is the case in the United States!

The people of Honduras, those born in the region, who must be distinguished carefully from the many laborers on the banana plantations who have come from Salvador, Nicaragua, and elsewhere, seem to know the native plants very well. Different regions of Central America vary widely in this respect. The best conditions I have ever found were in Salvador, where every one appears to know a name for almost every plant; the worst were in Costa Rica, otherwise the paradise of the botanist, where no one seems to know the name of any plant except those growing in the gardens. I have remarked, when thoroughly exasperated by such ignorance upon the part of people otherwise so far above the average of the Central Americans, that if nothing else were accomplished by botanical work in Costa Rica, it was to be hoped that the country people might have been taught some of the names that belonged to their common native plants.

In this flora the vernacular names printed immediately after the formal species entries are ones that I obtained myself from informants in the Tela region, and for the most part they are believed to be correct, with the usual allowance for mistakes in the identity of the plants upon the part of those from whom the names were received. There are added vernacular names also from other parts of Central America, with the hope that they may assist sometimes in identifying species. At any rate, it is of interest to all except closet botanists to know to what extent the names vary from one country to another.

Most of the Honduran names recorded are Spanish ones, of more or less obvious application to the plant concerned. A large number are derived from the Aztec or Nahuatl language, which was spoken formerly over so large an extent of Central America as well as in Mexico, and still colors thousands of the place names. Few languages surpass the Nahuatl in the number of botanical terms, and, fortunately, these names have been conserved in modern Spanish. Some of the Honduran names apparently are not Nahuatl, and evidently they are not Spanish. It is suspected that they may be derivatives from some of the non-Nahuatl Indian dialects of Honduras.

Many of the Honduran plant names recall familiarly those used for the same plants in Salvador. They may find their origin partly in the influx of Salvadorean laborers, who work on the banana plantations. It is more probable that they are another manifestation of the many resemblances existing between Salvador and Hon-

duras, some of which are based upon more than mere geographic propinquity. It must be admitted, however, that the resemblances between Salvador and Honduras in customs, people, or physiography, are rather subtle and intangible ones, although their existence can not well be denied.

Because of lack of time and of suitable informants, no attempt was made to assemble the "English" (so called by themselves alone) names employed for the plants by the British West Indians who have migrated into the banana country. In other parts of Central America these people apply to the local plants Jamaican or Barbadian names given to the same plants, or to others which, with their customary display of assurance based upon ignorance, they assume to be the same.

EXPLORATION OF THE REGION

The present flora is based almost wholly upon the collections made by the writer in 1927–28, which consisted of more than 3,000 numbers of phanerogams and cryptogams. The collection already has been the basis of several printed papers, one by Edwin B. Bartram enumerating the mosses,[1] and several by the present writer. In the *Gardeners' Chronicle*[2] there was published an illustrated account of the Lancetilla Experiment Station. In the *Journal of the Arnold Arboretum*[3] there appeared an account of the woody plants observed about Siguatepeque, in the interior of Honduras. In *Tropical Woods*[4] there was published an enumeration of all the trees known from the whole republic of Honduras. The new species obtained during the course of the work have been described in preceding volumes of the *Botanical Series* of Field Museum, in 1929 and 1930. The numerous new species of Piperaceae found on the Honduran coast have been described by Dr. William Trelease in the *Journal of the Washington Academy of Sciences*.[5]

Of the specimens collected during 1927–28 there are complete or nearly complete sets in the United States National Museum and in the herbarium of Field Museum. A set of the woody plants is deposited in the herbarium of Arnold Arboretum. The collections were determined and the present flora was written at Field Museum.

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[1] Mosses collected in Honduras by Paul C. Standley. Field Mus. Bot. 4: 349–364. 1929.

[2] 85: 462–464. 1929.

[3] 11: 15–46. 1930.

[4] 21: 9–41. 1930.

[5] 19: 327–337. 1929.

Of previous collections from the region the most important is that obtained by Percy Wilson of the New York Botanical Garden in 1903 about Tela, then known as Puerto Sierra. This collection consisted of 708 numbers, and a list of the determinations has been available to the writer through the courtesy of the collector. Mr. Wilson obtained several species that I did not find, and these have been listed here when their determinations could be verified with some assurance. Many of the numbers are represented by specimens in Field Museum.

Another collection is that made about Tela in 1926 by Mrs. Elizabeth R. Mitchell. Her specimens were determined at the Gray Herbarium by Dr. Ivan M. Johnston, and a partial set is in the herbarium of Field Museum. Mrs. Mitchell discovered several new species in the vicinity of Tela.

In 1929 W. D. Hottle of the Tela Railroad Company collected many trees of the Tela region, chiefly about Progreso. He obtained several important species not otherwise represented from Honduras. The most notable was *Dicraspidia*, a tree which the present writer would have traveled far to see had he suspected that it occurred so far away from Costa Rica, whence it was described originally.

In the same year W. N. Bangham and F. M. Salvoza graduate students of Harvard University, spent a short time collecting here for the Arnold Arboretum. A nearly complete set of Mr. Bangham's numbers is in the herbarium of Field Museum, to which it was sent through the courtesy of Dr. Alfred Rehder.

Dr. Holger Johansen has collected about La Lima, just outside the limits of this flora, a number of interesting trees, specimens of which he has presented to Field Museum. The only other near-by region of Honduras from which specimens are available is San Pedro Sula. From that locality a few numbers, collected by Thieme, were distributed by Captain John Donnell Smith, but San Pedro is so far from Tela and its flora so different that these collections have not been taken into consideration in the preparation of this report.

PLAN OF THE FLORA

The plan of the Lancetilla flora is sufficiently obvious to one who reads the following pages. It is intended to include all the plants of the region about Lancetilla Valley and the port of Tela (the Tela Division of the United Fruit Company), both flowering plants and cryptogams. The latter were collected rather casually, and the list of them is very incomplete. They can be gathered intelligently only

by a specialist in the groups concerned, but it has seemed worth while to list those actually collected, especially since so little—almost nothing, in fact—has been printed concerning the cryptogamic flora of Central America.

The descriptions given under the families and genera are intended to cover the Honduran species alone, and plants of the same groups found in other parts of Central America may in some instances be excluded by the descriptions. It has been intended to make the descriptions of species as simple as possible, although it is probable that in most cases, because of their brevity, they will be useful only to a botanist, who, after all, is the only one who can expect to name all the plants growing in an area of so large a flora. In the case of critical groups, in which only a botanist can be interested or can make proper determinations, the descriptive language is more technical.

ACKNOWLEDGMENTS

The writer wishes to acknowledge his indebtedness, above all, to Wilson Popenoe, Director of the Lancetilla Experiment Station, through whose keen interest in the natural history of Honduras there was undertaken the field work upon which the *Flora of the Lancetilla Valley* is based. Never have I worked amid such agreeable surroundings, with so many comforts, and with so many conveniences for the successful prosecution of field work. Fortunate are those who have the opportunity of working in such a congenial atmosphere as prevails at Lancetilla.

Every possible assistance in the conduct of the work was given by other employes of the Tela Railroad Company, whose resident manager, R. K. Thomas, showed a sympathetic interest in the project. The writer is deeply indebted, also, to Alfred F. Butler, of Lancetilla Station, whose interest in the work and whose uncanny attention to detail contributed so much toward the success of the season's undertaking.

On the trip to the interior, performed in connection with the exploration of the Lancetilla region, although its results are not recorded in the present paper, the writer was received everywhere courteously by the Honduran people with whom he came in contact. He received from them universally the most sympathetic assistance, but this occasioned no surprise, since he learned long ago to expect such a reception from Central American people, and would be convinced he was elsewhere than in Central America should he fail to receive it.

In the work of determining the Honduran collections substantial and deeply appreciated assistance has been received from a number of specialists upon various groups of plants. The following persons have aided in the completion of the *Flora of the Lancetilla Valley* by determining material in the groups indicated: Dr. M. A. Howe, New York Botanical Garden, algae; John A. Stevenson and other members of the staff of the Office of Mycology and Disease Survey, United States Department of Agriculture, Washington, D.C., fungi; Edwin B. Bartram, Bushkill, Pennsylvania, mosses; Dr. Th. Herzog, Jena, Germany, Hepaticae; Dr. William R. Maxon, United States National Museum, Washington, D.C., ferns; Professor A. S. Hitchcock and Mrs. Agnes Chase, United States Department of Agriculture, grasses; Professor Oakes Ames, Botanical Museum of Harvard University, orchids; Dr. William Trelease, Urbana, Illinois, Piperaceae; Ellsworth P. Killip, United States National Museum, Passifloraceae and Urticaceae; Dr. B. L. Robinson, Gray Herbarium, Cambridge, Massachusetts, Eupatorieae; Dr. S. F. Blake, United States Department of Agriculture, Compositae.

The fine photographs of Lancetilla plants used as illustrations of this volume were made by Frederick Coville, of the Lancetilla Experiment Station, from plants collected by the author. The other photographs also were supplied by the director of the station.

ANNOTATED LIST OF GENERA AND SPECIES

FUNGI

Unless otherwise indicated, the fungi of the following list were determined by John A. Stevenson of the United States Department of Agriculture. The writer is under special obligations to Mr. Stevenson for his discriminating work, and above all for the neat and usable report which he furnished upon the collection. Only those who are accustomed to receiving lists of determinations from specialists will know how unusual it is to receive such a well-prepared report.

PHYCOMYCETES

ALBUGINACEAE. White Rusts

Albugo Bliti (Biv.) Kuntze. On an undetermined host. Determined by Ross Davidson.

Albugo Ipomoeae-panduranae (Schw.) Sw. On *Ipomoea* sp.

Albugo platensis Swing. On *Boerhaavia erecta*. Determined by Davidson.

Albugo Tragopogonis (DC.) S. F. Gray. On *Verbesina myriocephala.*

ASCOMYCETES

MICROTHYRIACEAE. Black Molds

Asterina Caricarum Rehm. On *Carica Papaya.*

Asterina coriacella Speg. On *Cestrum* sp.

Asterina crotonicola Pat. On *Croton ciliato-glandulosus.*

Asterina diplocarpa Cke. On *Sida acuta.*

Asterina indecora Syd. On *Stigmaphyllon Lindenianum.*

Asterina vagans Speg. On *Solanum* sp.

PERISPORIACEAE. Black Mildews

Irene larviformis (Henn.) Stevens. On *Acalypha diversifolia* and *Acalypha* sp.

Irene sororcula (Speg.) Stevens. On *Eupatorium morifolium* and *Eupatorium* sp.

Irenina Anguriae Stevens. On *Gurania Makoyana.*

Irenina Bonplandii (Speg.) Stevens. On *Cupania glabra.*

Irenina glabroides Stevens. On *Piper* sp. and *Piper tuberculatum.*

Irenina hyptidicola Stevens. On *Hyptis verticillata.*

Irenina Laguncullariae (Earle) Stevens. On *Laguncularia racemosa.*

Irenina obscura Stevens. On *Saurauia* sp.

Irenina Perseae Stevens. On *Persea americana.*

Irenina Tremae (Speg.) Stevens. On *Myriocarpa yzabalensis.*

Irenopsis coronata (Speg.) Stevens var. **Triumfettae** Stevens. On *Luehea Seemannii* and *Heliocarpus* sp.

Irenopsis Molleriana (Wint.) Stevens. On *Pavonia rosea,* a new host for the species.

Irenopsis tortuosa (Wint.) Stevens. On *Piper auritum.*

Meliola bicornis Wint. On *Chamissoa altissima, Gliricidia sepium,* and *Lonchocarpus* sp.

Meliola bignoniacearum Stevens. On Bignoniaceae.

Meliola connariae Yates. On *Connarus Popenoei.*

Meliola Crescentiae Stevens. On *Crescentia Cujete.*

Meliola hispida Stevens. On *Calathea* sp.

Meliola longistipitata Stevens. On *Costus* sp.

Meliola malacotricha Speg. On *Ipomoea* sp.

Meliola marantacearum Stevens. On *Calathea* sp.

Meliola Merrillii Syd. On *Cissus sicyoides.*

Meliola Panici Earle. On *Lasiacis ruscifolia.*

Meliola Paulliniae Stevens. On *Paullinia* sp.

Meliola Pazschkeana Gaill. On *Bauhinia* sp.

Meliola Psidii Fr. On *Psidium Guajava.*

Meliola Psychotriae Earle. On *Hamelia erecta.*

Meliola Smilacis Stevens. On *Smilax mollis.*

Meliola strychnicola Gaill. On *Strychnos panamensis.*

Meliola Tabernaemontanae Speg. On *Tabernaemontana* sp.

Meliola Weigeltii Kunze. On *Astronium graveolens.*

Meliola Zetekii Stevens. On *Piper* sp.

Parodiella perisporioides (B. & C.) Speg. On *Vigna repens.*

Perisporina truncata (Stev.) Arn. On *Inga* sp.

TRICHOTHYRIACEAE

Trichothyrium dubiosum (Bom. & Br.) Theiss. On *Irenina Anguriae* Stevens on *Gurania Makoyana;* on *Irenina glabroides* Stevens on *Piper* sp.; on *Irenina hyptidicola* Stevens on *Hyptis verticillata;* on *Irenina Tremae* (Speg.) Stevens on *Myriocarpa yzabalensis;* on *Irenopsis coronata* (Speg.) Stevens var. *Triumfettae* Stevens on *Heliocarpus* sp.; on *Irenopsis Molleriana* (Wint.) Stevens on *Pavonia rosea;* on *Meliola bicornis* Wint. on *Chamissoa altissima.*

NECTRIACEAE

Paranectria meliolicola Stevens. On *Irene sororcula* (Speg.) Stevens on *Eupatorium* sp.

HYPOCREACEAE

Balansia trinitensis Cke. & Mass. On an undetermined host. Determined by W. W. Diehl.

Hypocrella sp. On *Aspidiotus cyanophylla* on *Cestrum* sp. Determined by Miss V. K. Charles.

Torrubiella rubra Pat. & Lagh. On *Anisosorus hirsutus*. Determined by Miss Charles.

Ustilaginoidea Setariae Bres. On an undetermined host. Determined by Diehl.

DOTHIDEACEAE

Scoleccoidea costaricensis Stevens. On *Miconia* sp.

PHYLLACHORACEAE

Phyllachora Tragiae (B. & C.) Sacc. On *Croton teucrioides*.

SPHAERIACEAE

Wallrothiella sp. On dead stems of *Piper* sp. Determined by C. L. Shear.

MYCOSPHAERELLACEAE

Mycosphaerella Cassiae Stevens. On *Cassia* sp. Determined by Davidson.

VALSACEAE

Eutypa heteracantha Sacc. On dead stems of *Piper* sp. Determined by Shear.

XYLARIACEAE

Camillea globosa Lev. On dead wood. Determined by Shear.

Camillea Sagraeana (M.) B. & C. On dead wood. Determined by Diehl.

Daldinia concentrica (Bolt.) Ces. & De N. On dead wood. Determined by Shear and Diehl.

Hypoxylon placentiforme B. & C. On dead wood. Determined by Diehl.

Xylaria anisopleura Mont. On dead wood. Determined by Shear and Diehl.

Xylaria cubensis (M.) B. & C. On dead wood. Determined by Diehl.

Xylaria dichotoma Mont. On dead wood. Determined by Shear and Diehl.

Xylaria guianensis Mont. On dead wood. Determined by Diehl.

Xylaria Schweinitzii B. & C. On dead wood. Determined by Diehl.

Xylaria scopiformis Kze. On dead wood. Determined by Shear and Diehl.

Xylaria tabacina Kx. On dead wood. Determined by Diehl.

PEZIZACEAE

Cookeina sulcipes (Berk.) Kuntze. On dead wood. Determined by Miss Edith Cash.

Cookeina tricholoma (Mont.) Kuntze. On dead wood. Determined by Miss Cash.

BULGARIACEAE

Calloriopsis gelatinosa (Ell. & Mart.) Syd. (*Belonidium leucorrhodinum* [Mont.] Sacc.). On *Irenina glabroides* Stevens on *Piper* sp. Determined by Miss Cash.

STICTIDACEAE

Tryblidiella rufula (Spreng.) Sacc. On dead sticks. Determined by Miss Cash.

HEMIBASIDIOMYCETES

The fungi of this group, to the end of the Pucciniaceae, were determined by Ross Davidson.

USTILAGINACEAE

Mycosyrinx Cissi (DC.) G. Beck. On *Cissus sicyoides.* This fungus very commonly attacks the inflorescences of the various species of *Cissus,* deforming them almost beyond recognition. Such a deformed inflorescence was once described from Mexico as the type of a new genus of flowering plants!

Ustilago Holwayana P. Henn. On *Paspalum conjugatum.*

TILLETIACEAE

Entyloma australe Speg. On *Physalis pubescens.*

COLEOSPORIACEAE

Coleosporium Elephantopodis (Schw.) Thüm. On *Elephantopus mollis.*

Coleosporium Ipomoeae (Schw.) Burr. On *Ipomoea reptans* and *Ipomoea* sp.

MELAMPSORACEAE

Alveolaria Cordiae Lagerh. On *Cordia* sp.

Endophylloides portoricensis W. & O. On *Mikania micrantha.*

Endophyllum circumscriptum (Schw.) W. & O. On *Cissus sicyoides.*

Pucciniosira pallidula (Speg.) Lagerh. On *Triumfetta* sp.

PUCCINIACEAE

Puccinia antioquiensis Mayor. On *Cyperus diffusus.*

Puccinia Asteris Duby. On *Aster exilis.*

Puccinia Cannae (Wint.) P. Henn. On *Canna* sp.

Puccinia circinata (Schw.) Arth. On *Stigmaphyllon ellipticum.*

Puccinia Lantanae Farl. On *Priva lappulacea.*

Puccinia Leptochloae Arth. & Fromme. On *Leptochloa virgata.*

Puccinia liberta Kern. On *Eleocharis* sp.

Puccinia Melampodii Diet. & Holw. On *Eleutheranthera ruderalis.*

Puccinia paupercula Arth. On *Pseudelephantopus spicatus.*

Puccinia Scleriae (Paz.) Arth. On *Scleria melaleuca.*

Puccinia tubulosa Arth. On *Solanum* sp.

Puccinia Urbaniana P. Henn. On *Cornutia grandifolia* and *Stachytarpheta jamaicensis.*

Uredo Dichromenae Arth. On *Dichromena ciliata.*

Uromyces Commelinae Cke. On *Zebrina pendula.*

Uromyces Neurocarpi Diet. On an undetermined host.

Uromyces proeminens (DC.) Pass. On *Euphorbia thymifolia.*

EUBASIDIOMYCETES

AURICULARIACEAE

Auricularia auricula-judae (Bull.) Schroet. On dead wood.

Auricularia delicata (Fr.) P. Henn. On dead wood.

Auricularia mesenterica (Bull.) Fr. On dead wood.

Hirneola polytricha (Mont.) Fr. On dead wood.

THELEPHORACEAE

Cladoderris dendritica Pers. On dead wood.

Hymenochaete damaecornis (Link) Lev. On dead wood.

Hypolyssus Montagnei Berk. On dead twigs.

Lachnocladium brasiliense Lev. On rotten wood.

Lachnocladium sp. On rotten wood.

Stereum aurantiacum (Pers.) Lloyd. On dead wood.

Stereum lobatum Schw. On dead wood.

Stereum papyrinum Fr. On dead wood.

Stereum sp. On dead wood and on soil.

Thelephora sp. On soil.

POLYPORACEAE. Pore Fungi

Daedalea amanitoides Beauv. Common on dead wood; varying from daedaloid to poroid.

Favolus brasiliensis Fr. On dead wood.

Fomes marmoratus (B. & C.) Cke. On dead wood.

Fomes pseudo-senex Murr. On dead wood. Determined by L. O. Overholts.

Hexagona tenuis (Hook.) Fr. On dead wood.

Lenzites striata (Sw.) Fr. On dead wood.

Polyporus caperatus Berk. On dead wood.

Polyporus conchoides (Mont.) Lloyd. On dead wood.

Polyporus dichrous Fr. On dead wood.

Polyporus licnoides Mont. On dead wood.

Polyporus lignosus Kl. On dead wood.

Polyporus lucidus (Curt.) Fr. On dead wood.

Polyporus modestus Fr. On dead wood. Determined by Overholts.

Polyporus omphalodes Berk. On dead wood.

Polyporus tricholoma Mont. On dead wood.

Polyporus zonalis Berk. On dead wood.

Polystictus crocatus Fr. On dead wood.

Polystictus maximus Mont. On dead wood.

Polystictus membranaceus (Sw.) Berk. On dead wood.

Polystictus occidentalis (Kl.) Fr. On dead wood.

Polystictus pavonius (Hook.) Fr. On dead wood. Determined by Overholts.

Polystictus pinsiteus Fr. On dead wood.

Polystictus sanguineus (L.) Fr. On dead wood.

Polystictus sector (Ehrb.) Fr. On dead wood.

Polystictus versatilis Berk. On dead wood.

Trametes cirrifera (B. & C.) Bres. On dead wood.

Trametes corrugata (Pers.) Bres. On dead wood.

Trametes hydnoides (Sw.) Fr. On dead wood.

Trametes rigida Berk. & Mont. On dead wood.

AGARICACEAE. Mushrooms

Determined by Miss V. K. Charles.

Flammula sp.

Lentinus crinitus (L.) Fr. On dead wood.

Lentinus strigellus B. & C. On dead wood.

Lentinus villosus Kl. On dead wood.

Lentinus sp. On dead wood.

Marasmius graminum (Lib.) B. & B. On dead plant remains.

Marasmius sp. On dead leaves.

Panus rudis Fr. On dead wood.

Pleurotus commiscibilis B. & C.

Schizophyllum commune Fr. On dead wood.

NIDULARIACEAE. Bird's-nest Fungi

Cyathus Montagnei Tul. On dead wood.

Cyathus pallidus B. & C. On dead wood.

LYCOPERDACEAE. Puffballs

Bovista sp. On soil.

Geaster sp. On soil.

Lycogalopsis Solmsii Ed. Fisch. On rotten wood.

FUNGI IMPERFECTI

PHYLLOSTICTACEAE

Asterostomella indecora Syd. On *Stigmaphyllon* sp.

Asterostomella Tremae Speg. On *Trema micrantha.*

MUCEDINACEAE

Acremonium Meliola Stevens. On *Meliola Paulliniae* Stevens on *Paullinia* sp.

DERMATIACEAE

Cercospora Canavaliae Syd. On *Canavalia* sp.

Haplographium portoricense Stevens. On *Canna* sp.

Helminthosporium sp. On *Irenina glabroides* Stevens on *Piper* sp.; on *Irene sororcula* (Speg.) Stevens on *Eupatorium morifolium;* on *Meliola Paulliniae* Stevens on *Paullinia* sp.

TUBERCULARIACEAE

Pucciniopsis Caricae (Speg.) Earle. On *Carica Papaya.*

FUNGI OF UNKNOWN AFFINITY

Scenomyces perplexans Stevens. On *Connarus Popenoei.*

ALGAE

The following seaweeds were found cast up on the beach at Tela. The specimens have been determined by Dr. M. A. Howe.

Sargassum polyceratium Mont.

Sargassum vulgare Ag.

Turbinaria turbinata (L.) Kuntze.

The following leaf-inhabiting alga was determined by John A. Stevenson:

Cephaleuros virescens Ktze. On leaves of *Aleurites*.

MUSCI. Mosses

The mosses listed here were determined by Edwin B. Bartram, who has published an annotated account of them (Field Mus. Bot. 4: 349–364. *pl. 17–19*. 1929).

FISSIDENTACEAE

Fissidens Kegelianus C. M. A widely distributed species of tropical America, but apparently not collected previously in Central America.

DICRANACEAE

Dicranella Herminieri Besch.

Holomitrium arboreum Mitt.

Leucoloma serrulatum Brid.

Leucoloma tortellum (Mitt.) Jaeg.

Trematodon reflexus C. M.

LEUCOBRYACEAE

Octoblepharum albidum (L.) Hedw.

Octoblepharum pulvinatum (Dox. & Molkb.) Mitt.

CALYMPERACEAE

Calymperes emersum C. M. Known otherwise only from Guatemala (the type locality) and southern Florida.

Syrrhopodon incompletus Schwaegr.

POTTIACEAE

Hyophila Tortula (Schwaegr.) Hamp.

FUNARIACEAE

Funaria calvescens Schwaegr.

SPLACHNACEAE

Splachnobryum Bernoullii C. M.

BRYACEAE

Bryum andicola Hook.

Bryum bursiforme Bartram. Known only from the type, collected in wet sandy soil, Lancetilla Valley.

Bryum coronatum Schwaegr.

Bryum Crugeri Hamp.

Bryum microbalanum Card.

Bryum Standleyi Bartram. Known only from the Tela region, the type collected on a log near Tela.

RHIZOGONIACEAE

Rhizogonium spiniforme (L.) Bruch.

BARTRAMIACEAE

Philonotis sphaericarpa (Sw.) Brid.

Philonotis tenella (C. M.) Besch.

ORTHOTRICHACEAE

Schlotheimia Sartorii C. M.

HELICOPHYLLACEAE

Helicophyllum torquatum (Hook.) Brid.

RHACOPILACEAE

Rhacopilum tomentosum (Sw.) Brid.

PTEROBRYACEAE

Orthostichopsis tetragona (Sw.) Broth.

METEORIACEAE

Meteoriopsis patula (Sw.) Broth.

Papillaria appressa (Hsch.) Jaeg.

Papillaria nigrescens (Sw.) Jaeg.

Pilotrichella rigida (C. M.) Besch.

NECKERACEAE

Homalia glabella (Sw.) Mitt.

Neckeropsis undulata (Palis.) Broth.

Porotrichum plicatulum Mitt.

HOOKERIACEAE

Callicostella ciliata (Schp.) Jaeg.

Callicostella cruceana (Dub.) Jaeg.

Callicostella pallida (Hsch.) Jaeg.

Crossomitrium Herminieri (Schp.) Jaeg. A species known previously only from the island of Guadeloupe.

Cyclodictyon albicans (Sw.) Broth.

Lepidopilum polytrichoides (Hedw.) Brid.

Rhynchostegiopsis flexuosa (Sull.) C. M.

THUIDIACEAE

Thuidium involvens (Hedw.) Mitt.

Thuidium miradoricum Jaeg.

BRACHYTHECIACEAE

Brachythecium stereopoma (Spruce) Jaeg.

Rhynchostegium patulum Bartram. Known only from this region, the type having been collected on a wet rock in the Lancetilla Valley.

SEMATOPHYLLACEAE

Sematophyllum galipense (C. M.) Mitt.

Sematophyllum Kegelianum (C. M.) Mitt.

Sematophyllum loxense (Hook.) Mitt.

Taxithelium planum (Brid.) Mitt.

Trichosteleum microcarpum (Sw.) Broth.

HYPNACEAE

Isopterygium diminutivum Bartram.

Microthamnium scalpellifolium C. M.

Vesicularia amphibola (Spruce) Broth.

HEPATICAE

The Hepaticae of the following list have been determined by Dr. Th. Herzog of Jena. Special thanks are due to him because of the difficulties and the large amount of work involved in making deter-

minations in this complicated group of plants. For some of the Hepaticae of certain groups which were not submitted to Dr. Herzog it has been impossible to obtain determinations up to the present time.

Aphanolejeunea sicaefolia (G.) Ev.

Archilejeunea viridissima (Ldbg.), f. **multiflora.**

Brachiolejeunea mamillata St.

Bryopteris brevis St.

Bryopteris tenuicaulis Tayl.

Bryopteris tenuicaulis Tayl. var. **flagellifera** Herzog.

Colura ceratophora (Nees).

Cyclolejeunea convexistipa (G.).

Cyclolejeunea peruviana (L. & L.).

Diplasiolejeunea pellucida (Meissn.).

Leptocolea cardiocarpa Ev.

Leptocolea scabriflora (G.).

Leptocolea Standleyi Herzog, sp. nov.

Leptolejeunea elliptica Spr.

Leptolejeunea stenophylla (L. & G.).

Lophocolea Liebmanniana (G.)

Lophocolea Liebmanniana (G.) var. **bisbifida** Herzog.

Lophocolea Liebmanniana (G.) var. **Martiana** Nees.

Lopholejeunea Sagraeana (Mont.).

Mastigolejeunea lobulata Herzog, sp. nov.

Odontolejeunea lunulata (Web.).

Physocolea microloba Herzog, sp. nov.

Plagiochila aliena G., f. **rupicola.**

Plagiochila hondurensis Herzog, sp. nov.

Ptychocoleus subfalcatus Herzog, sp. nov.

Radula pallens (Sw.).

Rectolejeunea flagelliformis Ev.

Symbiezidium barbiflorum St.

Symbiezidium setosum St.?

Symbiezidium transversale Trevis.

MARATTIACEAE. Marattia Family

DANAEA J. E. Sm.

Danaea nodosa (L.) J. E. Sm. A large coarse fern with a stout creeping rhizome; sterile fronds about a meter long, once pinnate, the pinnae 7–15 pairs, linear or oblong-linear, 3–5 cm. wide, abruptly long-acuminate; fertile fronds similar, but the pinnae much shorter and only 1.5–2.5 cm. broad.—Common in wet forest; widely distributed in tropical America.

SCHIZAEACEAE. Climbing Fern Family

LYGODIUM Sw.

Plants climbing, of indefinite growth; fronds pinnately or palmately divided; sporangia large and conspicuous, arranged in a row on each side of the midvein of the contracted segments, dorsal and solitary upon the simple veinlets.

Lygodium heterodoxum Kunze. Plants glabrous or nearly so.—Common in wet thickets; ranging from southern Mexico to Venezuela.

Lygodium polymorphum (Cav.) HBK. Plants densely hairy. —Growing in thickets about Tela and at La Fragua, but not common in this region; widely dispersed in tropical America. This is a common species of the drier regions of Central America, especially of the Pacific slope. In Salvador the names "palmera" and "crespillo" sometimes are applied to it.

GLEICHENIACEAE. Gleichenia Family

DICRANOPTERIS Bernh.

Dicranopteris pectinata (Willd.) Underw. Plants large and climbing, the rachises hard and tough, the branching dichotomous; pinnae deeply pinnatifid into linear segments, very glaucous beneath; sori small, rounded, borne upon the veinlets.—In wet thickets near Tela; apparently rare in this region; widely distributed in tropical America.

CYATHEACEAE. Tree Fern Family

To this family belong the tree ferns so characteristic of tropical American vegetation, although seldom forming a very conspicuous part of it. Not all ferns belonging to this family are treelike in their growth, however.

ALSOPHILA R. Br.

In this genus the sori have no indusium, but they are indusiate in the other genera listed here.

Alsophila blechnoides (Rich.) Hook. Plants acaulescent; leaves 1.5–2 meters long, simply pinnate, the numerous pinnae linear, entire or nearly so, with very long, slender, tapering tips.—In wet forest on the hills above Lancetilla; widely distributed in tropical America.

Alsophila microdonta Desv. Plants large, the trunk often 1–4 meters high, slender; fronds few, about 2 meters long, tripinnate, the pinnules pinnatifid into linear-oblong segments; stipes with numerous distant sharp spines, glabrate.—Collected only in a wet thicket near Tela; widely distributed in tropical America. The plants seen at Tela were young and acaulescent.

Alsophila Schiedeana Presl. Trunk slender, 2 meters high, covered with short spines; fronds tripinnate; stipes bearing numerous short thick spines, also furnished with abundant dark brown scales.—In forest and wet thickets about Lancetilla, but infrequent; extending to southern Mexico. Tree ferns of this and other species are quite rare about Lancetilla, and but few isolated individuals are found there. They are more plentiful in the higher mountains of Central America.

CYATHEA Sm.

Cyathea princeps (Linden) Mayer. Trunk sometimes very tall; fronds forming a large crown, reaching a length of 4 meters, tripinnate; stipes unarmed, clothed with narrow pale scales.—Only small sterile plants were collected, growing in wet forest above Lancetilla; ranging to southern Mexico.

HEMITELIA R. Br.

Hemitelia multiflora (J. E. Sm.) R. Br. Trunk about a meter high, or sometimes much taller, slightly spiny; fronds deeply tripinnatifid, the divisions of the pinnules rather coarsely toothed; stipes very spiny.—Occasional in wet forest about Lancetilla; ranging from Guatemala to Panama.

POLYPODIACEAE. Polypody Family

This family includes by far the greater number of the ferns. These plants are abundant in Central America, and there is a good

representation of them in the Tela region, a much larger number, doubtless, than is listed here. However, ferns are much more numerous in the mountains of Central America than in the lowlands.

ACROSTICHUM L.

Acrostichum aureum L. Plants very large and coarse, 1–2 meters high; leaves pinnate, the pinnae few, alternate, 15–30 cm. long, linear-oblong, very thick and leathery or fleshy, rounded at the tip, only the uppermost pinnae, if any, fertile.—Common in open swamps and marshes; widely distributed in the tropics of both hemispheres.

ADIANTUM L. Maidenhair Ferns

Terrestrial ferns with scaly rhizomes; leaves with dark and usually lustrous stipes; blades 1–5-pinnate or decompound; veins free in most species; sori appearing marginal, the sporangia borne on the under side of the sharply reflexed, membranous margin or lobes of the pinnules.

Adiantum latifolium Lam. Rhizome short-creeping; fronds ovate or transversely oblong, bipinnate, the stipe purplish black, polished, the pinnules numerous, 2–4 cm. long, inequilateral, green, acute or acuminate.—Common in wet forest and thickets; widely distributed in tropical America.

Adiantum obliquum Willd. Rhizome creeping, cordlike; fronds 25–60 cm. long, the stipes dark, polished; blades simply pinnate, the pinnae 8–13 pairs, alternate, lustrous on both sides, lanceolate or narrowly triangular, attenuate to the tip.—Occasional in wet forest and thickets; ranging from Guatemala to Brazil.

Adiantum petiolatum Desv. Rhizome short-creeping; fronds erect, the slender stipes black, polished, glabrous; blades 15–25 cm. long, once pinnate, the pinnae 4–12 pairs, glabrous, very glaucous beneath, inequilateral, lance-deltoid, obtuse to long-attenuate.—Occasional in wet forest and thickets; widely distributed in tropical America.

Adiantum pulverulentum L. Rhizome short-creeping; fronds suberect, the stipes polished, dark purple, scurfy; blades 25–60 cm. long and equally broad, 2-pinnate, the pinnules numerous, close together or imbricated, bright glossy green, dimidiate, the fertile ones narrowly oblong, 8–15 mm. long.—Common in wet forest and thickets; generally distributed in tropical America.

Adiantum tetraphyllum H. & B. Rhizome creeping, thick; fronds suberect, the stipe dark purple, polished, rusty-scurfy; blades broadly deltoid to rounded, 15–40 cm. long and broad, 2-pinnate, the numerous pinnules dark green, glossy above, slightly oblique, dimidiate, the fertile ones oblong to narrowly triangular-oblong, 1.5–2.5 cm. long.—Frequent in wet mountain forest; generally distributed in tropical America.

ANANTHACORUS Underw. & Maxon

Ananthacorus angustifolius (Sw.) C. Chr. Plants small, epiphytic, with a short creeping rhizome densely covered with scales; fronds broadly linear, 15–40 cm. long, 8–18 mm. wide, long-tapering to each end; sori linear, borne in a continuous line close to the margin. —On trees in wet forest on the hills above Lancetilla; widely dispersed in tropical America.

ANETIUM Splitg.

Anetium citrifolium (L.) Splitg. An epiphytic fern with fleshy creeping scaly rhizomes and brown feltlike roots; fronds pendent and flabby, oblanceolate, 10–30 cm. long, acuminate, entire; sporangia borne in groups within the areoles and upon the veins.—Frequent in wet forest, creeping on tree trunks or branches or on logs; ranging from Guatemala to Brazil.

ANISOSORUS Trev.

Anisosorus hirsutus (L.) Underw. & Maxon. A coarse terrestrial plant with thick short-creeping rhizome; fronds few, ascending, succulent, sometimes 1.5 meters long, the stipe with septate hairs; blades bipinnate-pinnatifid, the pinnules mostly 6–12 cm. long and 2–3 cm. wide, semiadnate, acuminate, coarsely pinnatifid, the veins free; sori 2 to each segment, marginal, oblong to linear.—Occasional in wet forest; ranging from Mexico to Bolivia.

ASPLENIUM L.

Small or large ferns, terrestrial or epiphytic, the fronds very variable; sori oval to linear, nearly straight, borne upon the free, usually oblique ultimate veins, usually below their tips; indusia present, lateral, as long as the sori, commonly membranous. One of the largest genera of ferns.

Asplenium auritum Sw. Epiphytic or terrestrial, the rhizome erect or decumbent, with soft thick scales; fronds few, the stipes

greenish and glabrous; blades pinnate, 12–30 cm. long, the numerous pinnae opposite or alternate, subsessile, linear to oblong, auricled at the base, often more or less serrate.—On trees in forest, or growing on mossy rocks; generally dispersed in tropical America.

Asplenium cuneatum Lam. Rhizome erect or decumbent; fronds numerous, the stipes fuscous, chaffy below; blades 20–40 cm. long, usually tripinnate near the base and bipinnate above, the pinnae numerous, subopposite, stalked, elongate-deltoid, 4–13 cm. long, the pinnules oblique, often broadly wedge-shaped, toothed near the apex; sori very oblique, narrowly linear.—On wet mossy rocks in forest; occurring in the West Indies and extending to Venezuela.

Asplenium falcinellum Maxon. Epiphytic, the rhizome suberect, with yellowish brown scales; fronds few, the stipes dull brownish; blades pinnate, the pinnae few pairs, lanceolate, long-attenuate, stalked, mostly 10–15 cm. long, subopposite or alternate.—On tree trunks in wet forest; sometimes growing on the trunks of tree ferns; ranging to southern Mexico.

Asplenium formosum Willd. Plants terrestrial, the rhizome very short; fronds numerous, 12–35 cm. long, erect, the stipes very short, dark purple; blades pinnate, the pinnae 25–50 pairs, subopposite or alternate, sessile, 10–18 mm. long, serrately incised.—On wet mossy rocks near streams in mountain forest, often growing at the edge of water; generally distributed in tropical America, and in Asia and Africa.

Asplenium laetum Sw. Terrestrial, the rhizome short-creeping; fronds few, ascending, 20–50 cm. long, the stipes half as long as the blade or longer, brown; blades linear-oblong, 4–8 cm. wide, pinnate, the pinnae 18–28 pairs, the lower ones opposite, the upper alternate, trapeziform-oblong, 2–4 cm. long, crenate-serrate.—On wet mossy rocks or on shaded banks in forest, frequent; ranging from Mexico to Brazil.

Asplenium otites Link. Terrestrial, with a short rhizome; fronds few, clustered, 7–15 cm. long, the stipes greenish; blades pinnate, the pinnae 12–18 pairs, 12–20 mm. long, blunt, bright green, sparsely toothed.—On moist shaded bank in forest; widely distributed in tropical America.

Asplenium pseuderectum Hieron. Epiphytic, the rhizome suberect; fronds few, spreading or ascending, 25–50 cm. long, the stipe very short, greenish, narrowly winged; blades linear, 4–8 cm. wide, pinnate, the pinnae 25–40 pairs, mostly alternate, sessile,

trapeziform-oblong, obtuse or acute, crenate-lobed.—On trees in wet forest; occurring in the West Indies and perhaps in Guatemala.

Asplenium radicans L. Rhizome erect, thick, densely covered with dark scales; fronds numerous, clustered, 25–60 cm. long, ascending and recurved, the stipes rather short, chestnut or purplish brown; blades pinnate, the tip of the rachis prolonged and naked, the pinnae oblong to oblong-lanceolate, 2–7 cm. long, the lowest opposite, the others alternate, obtuse to acuminate, cuneate at the base, sinuate or crenate-serrate.—Growing on logs in wet forest; widely distributed in tropical America.

Asplenium sanguinolentum Kunze. Rhizome erect, succulent, thick, the apex clothed with brown scales; fronds few or numerous, 45–80 cm. long, the stipe half as long as the blade, dark greenish brown, chaffy; blades pinnate, the pinnae 6–14 pairs, short-stalked, oblong-lanceolate, 5–9 cm. long, long-attenuate, crenate-serrate or biserrate.—On trees in wet forest; widely distributed in tropical America.

Asplenium serratum L. Epiphytic, the rhizome thick, erect, covered with brownish tomentose roots, the apex clothed with linear, dark brown scales; fronds often numerous, 50–100 cm. long, simple, the stipe nearly obsolete, the blade acuminate, attenuate to the base, 7–14 cm. wide.—On trees in wet forest; generally distributed in tropical America.

BLECHNUM L.

Terrestrial ferns with chaffy rhizomes; fronds small or large, the blades once pinnate, the pinnae nearly uniform, the fertile sometimes narrower than the sterile, the veins forked, the branches in sterile pinnae free, parallel, excurrent; sori elongate-linear, usually continuous, borne near or against the costa; indusia narrowly linear, continuous, facing the costa and at first usually meeting it.

Blechnum fraxineum Willd. Rhizome slender, creeping; fronds erect, with long greenish stipes; pinnae 6–8 on each side, linear or oblong-linear.—Growing on stream banks or in wet forest, but uncommon here; widely distributed in tropical America.

Blechnum occidentale L. Rhizome erect or curved-ascending, thick, scaly; fronds suberect, 30–60 cm. long, the stipe laxly chaffy, pale; pinnae numerous, linear.—On brushy banks near Tela; generally distributed in tropical America.

Blechnum serrulatum Rich. Rhizome stout, ascending; fronds erect, the long stipe smooth and nearly naked; blades 30–60 cm. long, the pinnae 12–24 pairs, linear-oblong, closely set, somewhat narrowed at the base.—Common in wooded swamps near the coast; widely dispersed in the tropics of both hemispheres.

CYCLOPELTIS J. Sm.

Cyclopeltis semicordata (Sw.) J. Sm. A large coarse terrestrial fern, the rhizome thick, erect or decumbent, scaly; fronds numerous, suberect, the stipe short, pale brown, scaly; blades pinnate, the pinnae very numerous, spreading, alternate, closely set, linear-attenuate to oblong-linear, 6–16 cm. long, nearly entire; sori round, dorsal or terminal on the vein branches; indusia orbicular, centrally peltate, deciduous.—Common in wet forests; generally distributed in tropical America. This is one of the most abundant ferns of the lowlands of Central America.

DENNSTAEDTIA Bernh.

Usually large terrestrial ferns, the rhizomes slender, creeping, densely hairy; fronds long-stipitate, without scales, the blades large, mostly elongate-deltoid, 2–4-pinnate, the ultimate segments incised or sinuate-lobed, the veins free, simple or pinnately branched; sori numerous, marginal, terminal, solitary, usually distant; indusium extrorse, convex, adnate to the lateral margins of a subequal, concave, usually recurved leaf lobule, the pouch thus formed shallowly or deeply cyathiform.

Dennstaedtia adiantoides (H. & B.) Moore. Stipes bright brown, shining, somewhat brown-hirsute at the base; blades broadly ovate, 1–1.4 meters long, 3-pinnate, the pinnae few, stalked; pinnules numerous, alternate, obliquely oblong or deltoid-oblong, roundish at the apex, mostly 1–2.5 cm. long, with 3 or 4 pairs of lobes.—Frequent in wet mountain forest; ranging from Guatemala to Bolivia.

Dennstaedtia ordinata (Kaulf.) Moore. Stipes brownish; blades deltoid, 1–1.5 meters long, the pinnae opposite, subsessile, the pinnules trapezoid-oblong, 5–9 mm. wide, incised-dentate to pinnatifid.—Frequent in wet forest; ranging to the West Indies and northern South America.

DICTYOXIPHIUM Hook.

Dictyoxiphium panamense Hook. A coarse terrestrial fern with a thick rhizome; fronds erect, short-stipitate, the stipe brown,

chaffy; blades dimorphous, the sterile ones linear, thin, entire, 4–7 cm. wide, long-tapering to each end, the fertile blades somewhat narrower, with continuous linear marginal sori.—In wet clay soil in dense forest on the hills above Lancetilla; ranging from Guatemala to Colombia.

DIPLAZIUM Sw.

Large or medium-sized ferns, terrestrial, the rhizomes creeping to erect, scaly at the apex; fronds stalked, the blades simple to 4-pinnate, the veins free; sori elliptic to elongate-linear, laterally attached, partly or wholly double; indusia mostly membranous, attached laterally, opening outward.

Diplazium arboreum (Willd.) Presl. Rhizome erect or curved-ascending; fronds several, the stipes nearly as long as the blades, stramineous; blades elongate-deltoid or subovate, 30–45 cm. long, the pinnae few, spreading, subopposite, short-stalked, mostly lanceolate and 10–20 cm. long, coarsely crenate-lobate or pinnatifid near the base.—In wet forest; widely distributed in tropical America.

Diplazium delitescens Maxon. Rhizome creeping, thick; fronds few, long-stalked, the stipe greenish; blades pinnate, the pinnae few, sessile, linear-lanceolate, long-tapering, serrate.—Frequent in wet forest; a common plant of the lowlands of Central America.

Diplazium Donnell-Smithii Christ. Fronds long-stipitate, the slender stipe greenish; blades deltoid-ovate, 40 cm. long or larger, nearly tripinnatifid, the pinnae short-stalked; pinnules lance-rhombic or trapeziform, serrate.—Growing on a wet mossy rock in forest; the species was based upon material collected in the region of San Pedro Sula, Honduras.

Diplazium grandifolium Sw. Rhizome thick, erect; fronds few, up to 1 meter long, the stipe blackish brown; blades pinnate, the pinnae 10–15 pairs, mostly alternate, oblong, long-acuminate, 8–15 cm. long, the lower ones stalked.—Frequent in wet forest; ranging to the West Indies and northern South America.

Diplazium plantaginifolium (L.) Urban. Rhizome erect or curved-ascending; fronds few, long-stipitate, the stipes grayish; blades simple, oblong-lanceolate to lance-linear, 15–30 cm. long, 3.5–7 cm. wide, long-acuminate, often rounded at the base.—Frequent in wet mountain forest; widely distributed in tropical America.

Diplazium striatum (L.) Presl. Rhizome thick, erect or ascending; fronds several, 1–2 meters long, the stipes yellowish brown;

blades narrowly to broadly oblong, 70–140 cm. long, pinnate-pinnatifid or at the base nearly 2-pinnate, the pinnae 13–25 cm. long; pinnules 6–12 mm. wide, oblong, distantly serrulate.—In wet forest on the hills; ranging from Mexico to northern South America.

DRYOPTERIS Adans.

Small or large terrestrial ferns, the fronds mostly erect or nearly so; rhizomes slender and wide-creeping or thick and erect, naked or scaly; blades uniform, 1–3-pinnate or decompound, rarely simple, the veins free, connivent, or regularly areolate; sori mostly roundish, dorsal, with or without an indusium, the indusium usually roundish-reniform and fixed at its sinus.

Dryopteris dentata (Forsk.) C. Chr. Rhizome erect or decumbent, the apex clothed with brownish scales; fronds ascending, 30–120 cm. long, the stipes shorter than the blades, dark stramineous; blades lanceolate to oblong-ovate, usually narrowed at the base, 25–80 cm. long, pinnate, the rachis tomentose; pinnae sessile, pinnatifid about three-fourths the distance to the costa, the segments oblong, 4–9 mm. long, 3–4 mm. wide, rounded-obtuse or acutish, entire to crenulate, short-pilosulous.—Growing in wet thickets; widely dispersed in tropical America.

Dryopteris effusa (Sw.) Urban var. **divergens** (Willd.) Hieron. Rhizomes short-creeping, thick, bearing few large, reddish brown scales; fronds 0.5–2 meters long, the stipes dark stramineous, scaly at the base; blades deltoid, 30–100 cm. long and nearly as broad, 3–4-pinnate and pinnatifid, the basal pinnae much the largest, deltoid, stalked, the ultimate segments chiefly oblong or ovate-oblong, serrate to serrate-pinnatifid, decurrent, lustrous above, beneath bearing many minute appressed reddish glandlike hairs.—Frequent in wet forest; widely dispersed in tropical America.

Dryopteris equestris (Kuntze) C. Chr. Plants large and coarse, the long stipe covered at the base with long, soft, pale brownish, hairlike scales; blades oblong, tripinnate-pinnatifid, the pinnae stalked, the ultimate divisions falcate-oblong, acute, serrulate, ciliate, hirtous above along the veins, glandular beneath.—In wet forest; extending to Mexico.

Dryopteris Ghiesbreghtii (Linden) C. Chr. Fronds few, suberect, the stipe villous; blades rather large, once pinnate, the pinnae 7–17, oblong, mostly 15–45 cm. long, long-acuminate, crenate, densely

soft-hairy.—Frequent in wet forest and thickets; ranging to Mexico and common in the lowlands of Central America.

Dryopteris glandulosa (Blume) Kuntze, var. **brachyodus** (Kunze) C. Chr. Plants coarse, the stipe naked; blades 60–90 cm. long, once pinnate, the pinnae 15–20 cm. long, oblong-linear, attenuate, lobed from one-third to one-half the distance to the costa into oblong, slightly falcate lobes, these coriaceous, naked; lower pinnae nearly as large as the others.—Common in wet forest; widely distributed in tropical America and in Malaysia.

Dryopteris gongylodes (Schkuhr) Kuntze. Rhizome wide-creeping, slender; fronds distant, erect, 0.5–2 meters long, the long stipes usually light brown from a darker base, polished, naked; blades linear to oblong, up to 1 meter long and 45 cm. wide but commonly much smaller, pinnate, the pinnae numerous, distant, linear-attenuate, mostly 5–15 mm. wide, stalked, deeply crenate-dentate or lobed halfway to the costa, glabrous above, glabrous or pilosulous beneath and capitate-glandular on the costae and costules.—Growing in wooded swamps near Tela; widely distributed in tropical America.

Dryopteris interjecta C. Chr. Plants large, with a thick rhizome, the long stipe covered at the base with long, hairlike, pale brown scales; blades large, bipinnate, the ultimate segments narrowly oblong, decurrent, deeply crenate, deep green above, somewhat paler and naked beneath.—Common in wet forest and thickets; also in Guatemala.

Dryopteris Mercurii (A. Br.) Hieron. Plants large, the stipes pale, sparsely chaffy; blades up to 1 meter long, pinnate, the numerous pinnae pinnatifid nearly to the costa, the segments narrowly oblong, obtuse, entire or nearly so, almost naked, the lowest pinnae much shorter and smaller than the upper ones.—Frequent in wet thickets; extending to Colombia.

Dryopteris nicaraguensis (Fourn.) C. Chr. Plants coarse, with thick rhizomes, the fronds few, the elongate stipe nearly naked, brownish; blades pinnate, the pinnae rather numerous, nearly equal, oblong-linear, long-attenuate, sessile or nearly so, naked.—Frequent in wet forest and thickets; widely distributed in Central America.

Dryopteris obliterata (Sw.) Urban. Fronds few, suberect, the stipe brownish, almost naked; blades pinnate, the pinnae few or numerous, subequal or the lowest somewhat smaller, linear or oblong-linear, long-tapering, short-stalked, alternate, lobed about one-third the distance to the costa, the lobes somewhat falcate, acutish, naked,

the leaf tissue somewhat lustrous.—Frequent in wet thickets; occurring in the West Indies and Mexico.

Dryopteris panamensis (Presl) C. Chr. Fronds erect, the stipes short, straw-colored; blades long and narrow, pinnate, the pinnae very numerous, the lowest much reduced, all pinnatifid nearly to the costa, the segments oblong, somewhat falcate, obtuse, nearly naked.—Growing along the edge of the river near Lancetilla; one of the common ferns of Central America.

Dryopteris serrata (Cav.) C. Chr. Plants large and coarse, the rhizome thick, short-creeping; fronds erect, 1–2 meters long, the stipes straw-colored, glabrate; blades broadly oblong to deltoid-lanceolate, 50–90 cm. long, 20–45 cm. wide, pinnate, the pinnae mostly short-stalked, linear-attenuate, sharply serrate.—Frequent in wooded swamps near the coast; generally dispersed in tropical America.

Dryopteris subtetragona (Link) Maxon. Plants coarse, the rhizome thick, short-creeping; fronds several, close, erect, up to 1 meter high, the stipes straw-colored, stellate-pubescent; blades ovate-oblong to deltoid-oblong, mostly 30–45 cm. long, 12–25 cm. wide, pinnate, the pinnae 6–12 pairs, distant, short-stalked, linear-attenuate, pinnatifid two-thirds or halfway to the costa, the segments oblique, obtuse, entire.—In wet thickets; widely distributed in tropical America.

Dryopteris sp. An unnamed species, represented by *Standley 53507*, collected in a wet thicket in the Lancetilla Valley. The blades are pinnate, the few large pinnae broad and shallowly crenate.

Dryopteris sp. Another plant of which it has been impossible to obtain the specific name. A low plant with graceful fronds, the blades pinnate, the pinnae deeply lobed. Represented by several numbers, and common on the forested hills about Lancetilla.

ELAPHOGLOSSUM Schott

Epiphytic ferns with usually creeping and very chaffy rhizomes; fronds erect or pendent, commonly stipitate, dimorphous, the blades simple and entire, the sterile ones sparsely or densely scaly, their veins simple or mostly forked; fertile blades often different in form from the sterile, the whole under surface densely covered with sporangia.

Elaphoglossum apodum (Kaulf.) Schott. Stipes only 1–3 cm. long, or wanting; sterile blades linear-oblanceolate, 2.5–5 cm. wide,

long-acuminate, covered on both surfaces with long rigid brown hair-like scales.—On trees in wet forest above Lancetilla; ranging from Guatemala to the West Indies and northern South America.

Elaphoglossum firmum (Mett.) Underw. Sterile fronds long-stipitate, the blades linear-oblanceolate, 18–40 cm. long, 2–4.5 cm. wide, long-acuminate, long-attenuate to the base, coriaceous, bearing only a few minute depressed scales and appearing glabrous.—On trees in wet forest on the hills above Lancetilla; also in the Greater Antilles.

Elaphoglossum Herminieri (Bory & Fée) Moore. Sterile fronds exstipitate or nearly so, linear, 30–95 cm. long, 1.5–4 cm. wide, attenuate to the apex and base, very thick, with few obscure depressed scales on both sides but appearing glabrous.—On a tree in wet forest on the hills above Lancetilla; widely distributed in tropical America.

ESCHATOGRAMME Trev.

Eschatogramme panamensis C. Chr. A rather small epiphytic fern, the rhizome short-creeping, densely tomentose; fronds 15–45 cm. long, pinnatifid into long narrow tapering entire segments, the under surface thinly clothed with minute scales, the veins anastomosing; sori submarginal, continuous or interrupted.—Growing on small trees in wet forest, frequent; ranging to Panama.

HEMIDICTYUM Presl

Hemidictyum marginatum (L.) Presl. A large and rather coarse fern, the rhizome stout, erect, densely scaly, the scales brownish; fronds stipitate, the blades glabrous, pinnate, the pinnae opposite, sessile, linear-oblong, 25–55 cm. long and 6–12 cm. wide, nearly entire, the veins spreading, parallel, mostly once forked near the base; sori linear, confined to the main branches of the veins, simple, the indusia lateral, membranous.—In wet forest; ranging from Mexico to Brazil.

HEMIONITIS L.

Hemionitis palmata L. *Estrella. Plate VI.* Plants small, the rhizomes short, suberect; fronds few, erect, the stipes elongate, dark brown, villous; blades 5-angled, 5–15 cm. long, soft, 3-parted, villous-hirsute beneath, the veins anastomosing; sporangia in copious superficial lines following the course of the veins.—Frequent in wet forest and thickets, often in second growth; widely dispersed in tropical America.

LEPTOCHILUS Kaulf.

Plants terrestrial or epiphytic, the rhizomes rather slender, creeping or scandent, chaffy; fronds dimorphous, the blades simple and entire to pinnate and pinnatifid, the fertile ones narrow or with narrow divisions, the veins anastomosing; sporangia covering the under side of the fertile blades, without indusia.

Leptochilus alienus (Sw.) C. Chr. Terrestrial, the rhizome creeping; sterile fronds 35–65 cm. long, the long stipes bearing a few deciduous scales; blades deltoid, 15–30 cm. long, pinnate below, the pinnae linear, attenuate, crenate-lobed; areoles with numerous included veinlets.—Frequent in wet forest; ranging to the West Indies and Bolivia.

Leptochilus cladorrhizans (Spreng.) Maxon. Terrestrial, the rhizome creeping, appressed-scaly; sterile fronds 35–65 cm. long, the long stipes stramineous to pale brown, bearing a few deciduous scales, pinnate below, pinnatifid above, the narrow segments crenate or shallowly lobed; areoles without included veinlets.—Common in wet forest; sometimes growing on mossy rocks along streams; ranging from Mexico to Colombia.

Leptochilus Donnell-Smithii (Christ) C. Chr. Epiphytic, the rhizomes scandent on tree trunks; fronds large, pinnate, the stipe covered with long, dark brown scales at the base; pinnae numerous, distinct, linear-attenuate, very shallowly crenate; segments of the fertile blades very short, distant, and narrowly linear.—On trees in wet forest; also in Guatemala.

Leptochilus nicotianifolius (Sw.) C. Chr. Epiphytic or terrestrial, the rhizome wide-creeping or scandent; sterile fronds up to 1 meter long; blades pinnate, the pinnae 1–4 pairs, narrowly oblong or lance-oblong, 15–25 cm. long and 5–9 cm. wide, acuminate, mostly short-stalked; pinnae of the fertile fronds mostly 1–2 cm. wide.—In wet forest, sometimes creeping on shrubs; occurring in Central America and the West Indies.

Leptochilus pergamentaceus Maxon. Terrestrial, the rhizome creeping, slender; sterile fronds up to 1 meter long; pinnae 2–5 pairs, alternate, oblique, ovate to broadly oblong, sessile, entire or nearly so. —In wet mountain forest; ranging from Guatemala to Venezuela, and in the West Indies.

LINDSAEA Dryand.

Lindsaea lancea (L.) Bedd. Rhizome thick, creeping, densely scaly; fronds several, close together, erect, 40–80 cm. long, the stipes

long, straw-colored; blades mostly 2-pinnate, 20–40 cm. long, with 1–5 pairs of spreading pinnae, the segments numerous, close, spreading, dimidiate-oblong, entire, the upper margin strongly curved; sori continuous and linear.—In wet forest on the hills above Lancetilla, infrequent; widely distributed in tropical America.

NEPHROLEPIS Schott

Epiphytic ferns (the species here listed), the rhizomes scandent, chaffy; fronds pendent, narrow, stipitate; blades simply pinnate, the pinnae very numerous, spreading, usually auricled at the upper base; veins free, 1–4-forked; sori terminal upon the vein branches, the indusia lunate or orbicular, attached at the sinus.

The common Boston fern, seen so generally in cultivation, is a member of this genus.

Nephrolepis biserrata (Sw.) Schott. Fronds 1–5 meters long; blades 15–40 cm. wide, the pinnae linear-attenuate, 1–2.5 cm. wide.—Frequent in forest, often growing on palm trunks; widely distributed in the tropics of both hemispheres.

Nephrolepis pendula (Raddi) J. Sm. Fronds very long and narrow, pendent, mostly 4–5 cm. wide, the pinnae oblong, very obtuse.—Frequent in wet forest or in open places, growing commonly on palm trunks; ranging to South America.

PALTONIUM Presl

Paltonium lanceolatum (L.) Presl. An epiphytic fern, the rhizomes short-creeping, chaffy; fronds numerous, 20–40 cm. long, the short stipe light brown; blades leathery, lance-linear, 1.5–4 cm. wide, long-attenuate to each end, entire; veins deeply immersed, anastomosing; sori linear, intramarginal, without indusia.—Growing on trees in wet mountain forest; also in the West Indies and Florida. When fresh, the very thick fronds are brittle.

PITYROGRAMMA Link

Pityrogramma calomelaena (L.) Link. *Silver fern.* Terrestrial, the rhizome thick, erect or decumbent, scaly at the apex; fronds clustered, erect, up to 1 meter high but usually smaller, the long stipes dark purple, lustrous; blades lanceolate to deltoid-ovate, 20–60 cm. long, bipinnate; pinnules subdistant, oblique, serrate or pinnatifid, densely covered beneath by a white powder; sori following the course of the veins, usually confluent at maturity, without indusia.—

Common in wet thickets, sometimes even a weed in gardens; one of the most abundant, weedy ferns of tropical America; occurring also in tropical Africa.

POLYBOTRYA H. & B.

Terrestrial or epiphytic ferns, rather coarse, the rhizome creeping or scandent, dense chaffy; fronds large, long-stipitate; blades simply pinnate to pinnately decompound, dimorphous; veins pinnately branched or once forked, united at their apices by a transverse apical vein; fertile blades contracted, scarcely leaflike, their ultimate divisions covered beneath with sporangia; indusia none.

Polybotrya aucuparia Christ. Terrestrial, with a long creeping rhizome covered with narrow brown scales; blades pinnate or above merely pinnatifid, the pinnae mostly serrate or only shallowly lobed. —Common in wet forest; ranging to Costa Rica.

Polybotrya villosula Christ. Epiphytic, the rhizomes creeping on tree trunks; blades bipinnate, the segments lobed or toothed, conspicuously pilose.—Common in wet forest; extending to Costa Rica.

POLYPODIUM L.

Small or large ferns, terrestrial or epiphytic, the rhizomes chaffy, usually slender and creeping; fronds mostly uniform, pendent to erect; blades simple to 3-pinnate, the veins free or areolate; sori round to elliptic, large, dorsal upon the veinlets or rarely terminal, without indusia.

Polypodium astrolepis Liebm. Epiphytic, the rhizome cord-like, wide-creeping, black; fronds distant, 8–20 cm. long, the stipes dark, greenish-margined; blades linear to oblanceolate, 7–18 mm. wide, obtuse to long-acuminate, entire; leaf surface sparsely lepidote; sori elliptic to linear, 2–10 mm. long.—Frequent on trunks or limbs of trees in wet forest; generally distributed in tropical America.

Polypodium ciliatum Willd. Epiphytic, the rhizomes very long and slender, covered with slender scales; sterile fronds short-stipitate, elliptic-oblong, entire, mostly 3–5 cm. long, obtuse or acute, nearly naked or sparsely scaly; fertile blades much narrower, the large round sori projecting beyond the edge.—Common on trees in wet forest; widely distributed in tropical America.

Polypodium crassifolium L. Epiphytic, the rhizome woody, thick, short-creeping, densely chaffy; fronds few, erect, 40–130 cm. long, short-stipitate; blades linear-oblong to ligulate, 4–14 cm. wide,

coriaceous, opaque, entire; sori mammiform, round or oval, 3–5 mm. broad.—On trees in wet forest; generally dispersed in tropical America.

Polypodium decumanum Willd. Epiphytic, the rhizome creeping, densely soft-scaly; fronds few, 1–2 meters long, the stipes glossy brown; blades pinnatisect below, pinnatifid above, the segments few, obliquely spreading, 15–40 cm. long, 3–7 cm. wide, acuminate, usually constricted near the base.—Growing on logs or trees in wet forest; widely distributed in tropical America.

Polypodium duale Maxon. Epiphytic, the plants forming small dense colonies, the rhizomes filiform; fronds 2–10 cm. long, short-stipitate; blades linear, 1–3 mm. wide, deeply serrate, the lobes acute; fertile fronds longer than the sterile, only the apical portion fertile.—On trees in wet forest; widely dispersed in tropical America and in Africa. One of the smallest of Central American ferns.

Polypodium fallax Cham. & Schlecht. Epiphytic, the rhizomes very slender and wide-creeping; blades stipitate, 1–3.5 cm. long, the pinnae few and distinct, the lowest deeply pinnatifid, with linear lobes, the lower surface with minute scattered scales; sori large and prominent, often only one to a pinna.—On trees in wet forest; ranging from Mexico to Costa Rica.

Polypodium latum (Moore) Sodiro. Rhizome thick and short-creeping; fronds several, erect, 30–130 cm. long, glabrous, the stipes 5–15 cm. long, green to light brown; blades mostly oblanceolate, abruptly acute or acutish, 5–13 cm. wide, long-attenuate to the base, entire, leathery, somewhat lustrous; sori large, borne in 2–4 rows between the main lateral veins.—On mossy rocks in wet forest; widely distributed in tropical America.

Polypodium lycopodioides L. Epiphytic, the rhizome cordlike, widely creeping, slender, densely chaffy; fronds distant, exstipitate or nearly so, 5–20 cm. long, entire, the sterile blades mostly linear-lanceolate, 5–15 mm. wide; sori large, impressed, in a single series.—Creeping on trees in wet forest, common; widely dispersed in tropical regions.

Polypodium Palmeri Maxon. Epiphytic, similar to *P. lycopodioides*, the rhizomes much stouter, densely chaffy; fronds nearly exstipitate; sterile blades mostly oblong or lance-oblong, entire, chiefly 10–15 cm. long, 2–4 cm. wide; fertile blades narrower; sori large, in a single series.—Noted only near the coast about Tela, creeping on stumps and tree trunks; ranging from Mexico to Panama.

Polypodium percussum Cav. Epiphytic, the rhizome wiry, wide-creeping, brown-chaffy; fronds stipitate, scattered, erect, the blades 15–30 cm. long, linear-lanceolate, long-tapering to each end, thick, rigid, with fine scattered scales on the lower surface; sori round, deeply immersed, in a single series.—On trees in wet forest; extending to South America.

Polypodium polypodioides (L.) Watt. Epiphytic, the rhizomes slender, wide-creeping, densely scaly; fronds distant, erect, 5–25 cm. long, the stipes shorter than the blades, peltate-scaly; blades linear-oblong to deltoid-oblong, 4–15 cm. long, pinnatisect, the segments linear to oblong, 2.5–5 mm. wide, densely scaly on both surfaces; leaf tissue thick and opaque.—Occasional on trees in wet forest; widely distributed in tropical America, and ranging northward to Virginia. Sometimes called resurrection fern in the United States because of the fact that the fronds become inrolled in dry weather, and resume their normal form when moistened by rain.

Polypodium rhachipterygium Liebm. Epiphytic, the rhizome stout, scaly; fronds stipitate, the stipes glossy; blades large, subdeltoid, simply pinnate, the divisions alternate, rather distant, linear, entire or nearly so; sori in a single series on each side of the costa.—On trees in wet forest; in Mexico and Central America.

Polypodium serpentinum Christ. Epiphytic, the rhizome cordlike, creeping; fronds short-stipitate, 25–35 cm. long, 2.5–4.5 cm. wide, linear-lanceolate, acuminate, long-tapering to the base, entire or nearly so, thin; sori round, usually 2 in each areola.—Creeping on shrubs in wet forest; ranging to Costa Rica.

POLYTAENIUM Desv.

Polytaenium Feei (Schaffn.) Maxon. A pendent epiphytic fern, the rhizomes short, with brown feltlike roots; fronds numerous, linear, entire, 20–50 cm. long, 1–2 cm. wide, attenuate to each end, somewhat fleshy; venation reticulate; sori indefinite, borne dorsally in lines on some or all the veins.—On trees in wet forest; extending from Mexico to northern South America.

PTERIS L.

Coarse terrestrial ferns, the rhizomes usually stout, creeping to erect, scaly; fronds erect or ascending, clustered, with chiefly green or straw-colored stipes; blades 1–4-pinnate; sori linear, the sporangia borne in continuous rows along the margins of the segments, indusiate.

Pteris Kunzeana Agardh. Stipes often a meter long; blades 3-pinnate, the ultimate divisions pinnatifid into numerous sharp-pointed falcate lobes, these sometimes serrate.—Common in wet forest; widely distributed in tropical America.

Pteris pungens Willd. Rhizome short, ascending, thick; fronds sometimes 1 meter long and more, the stipe equaling or longer than the blade, sparsely aculeolate; blades 30–60 cm. long, pinnate, the pinnae pinnately parted into linear, slightly falcate, obtuse or acutish lobes.—In wet forest; widely distributed in tropical America.

RHIPIDOPTERIS Schott

Rhipidopteris peltata (Sw.) Schott. A small epiphytic fern, the rhizomes filiform, interlacing and forming loose colonies; sterile fronds 3–15 cm. long, the blades reniform, 2.5–5 cm. wide, 4–6 times dichotomously divided into linear radiating segments; blades of fertile fronds suborbicular, long-stipitate, 5–20 mm. long.—On trees in wet forest; ranging from Mexico to northern South America.

STENOCHLAENA J. Sm.

Epiphytic ferns, the rhizomes woody and scandent, scaly, sometimes aculeate; fronds distant, usually dimorphous, the sterile ones once pinnate or simple; fertile fronds contracted; veins simple or forked; fertile pinnae covered beneath with sporangia; indusium none.

Stenochlaena marginata (Schrad.) C. Chr. Sterile fronds simple, the blades oblanceolate, stipitate, narrowly acuminate.—Growing on rocks in wet forest; widely dispersed in tropical America and in Africa.

Stenochlaena recurvata (Fée) Liebm. Rhizome stout, densely scaly; sterile fronds pinnate, the pinnae 10–15 cm. long, cuneate at the base; sterile pinnae about 2 mm. wide.—Common; climbing on trees in wet forest; also in the West Indies.

Stenochlaena vestita (Fourn.) Underw. Sterile fronds pinnate, the pinnae 4–7 cm. long, truncate at the base, with long narrow tapering tips.—Creeping on trees in wet forest, common; widely distributed in Central America.

TECTARIA Cav.

Usually large and coarse, terrestrial ferns, the rhizomes woody, stout, creeping to erect, chaffy; fronds few, suberect; blades simple

or 1–2-pinnatifid; veins mostly anastomosing; sori numerous, irregularly disposed or borne in rows near the ultimate costae; indusia persistent or caducous.

Tectaria euryloba (Christ) Maxon. Blades lax and thin, deeply pinnatifid, the lobes few, oblong, acute or acuminate, contracted toward the base; sori very numerous, minute.—Frequent on wet clay slopes in shaded ravines; extending to Costa Rica.

Tectaria heracleifolia (Willd.) Underw. Rhizome erect or curved-ascending; fronds few, clustered, 50–85 cm. long, long-stipitate; blades deltoid-ovate, 20–40 cm. long, pinnately 3-foliolate, with 2–3 pairs of lateral pinnae; basal pinnae usually deeply 3-lobed, the others oblong-lanceolate, long-attenuate; sori large, the indusia orbicular, centrally peltate.—Common in wet forest; ranging from Florida and Mexico to Venezuela.

Tectaria martinicensis (Spreng.) Copel. Rhizome erect, very thick; fronds numerous, suberect, 0.5–1.5 meters long, the stipes about equaling the blades, pale or yellowish brown; blades 30–75 cm. long, the pinnae commonly 3–8 pairs, those of the basal pair stalked and deeply 2-lobate; indusia reniform, attached at the sinus. —Frequent in wet thickets; generally distributed in tropical America.

Tectaria plantaginea (Jacq.) Maxon. Rhizome creeping; fronds 20–60 cm. long, the stipe much shorter than the blade; blades simple, oblong to oblanceolate, 4–11 cm. wide, entire.—Occasional in wet forest; ranging southward to the Guianas.

TRISMERIA Fée

Trismeria trifoliata (L.) Diels. A coarse fern with stout erect rhizomes; fronds numerous, clustered, commonly 1 meter long or less; stipes dark purple or chestnut-colored; blades mostly 40–100 cm. long, pinnate, the pinnae simple or trifoliolate, stalked, linear, glabrous; veins free, repeatedly dichotomous; sori following the course of the veins, without indusia.—Collected here only at Quebrada Seca, growing along a ditch; widely distributed in tropical America.

VITTARIA J. E. Sm.

Epiphytic ferns with erect or short-creeping rhizomes; leaves pendent, often very numerous, narrowly linear and grasslike, simple and entire; venation reticulate; sporangia borne in a continuous line upon the intramarginal vein.

Vittaria filifolia Fée. Rhizome scales yellowish brown to castaneous, attenuate, pluricostate almost to the tip; fronds 10–40 cm. long, 1–3 mm. wide.—Pendent on logs in wet forest; widely distributed in tropical America.

Vittaria lineata (L.) J. E. Sm. Rhizome scales dark brown, the long filiform tips unicostate; fronds 30–100 cm. long, 2–3 mm. wide.—Pendent from palm trunks; generally dispersed in tropical America.

HYMENOPHYLLACEAE. Filmy Fern Family

The ferns composing this family are chiefly delicate epiphytic plants with slender wide-creeping rhizomes, the blades ranging from roundish and entire to 4-pinnate. The leaf tissue is usually membranous and pellucid. The sori are marginal, the indusia being tubular to salverform and immersed or short-stalked.

HYMENOPHYLLUM J. E. Sm.

Hymenophyllum sp. A single species of this genus was collected, growing on a tree in wet forest high on the hills above Lancetilla. Dr. Maxon reports the plant without specific determination.

TRICHOMANES L.

Trichomanes diversifrons (Bory) Mett. Plants terrestrial, erect; sterile fronds pinnatifid into numerous narrow segments; fertile fronds long-stalked, long and linear.—Frequent in wet forest, growing on clay banks; widely dispersed in tropical America. This is the only local species of the genus which is terrestrial in habitat.

Trichomanes Godmani Hook. Plants very slender, often forming loose mats, the small fronds about 1 cm. long, simple, rounded or obovate.—Occasional on tree trunks in wet forest; ranging from Guatemala to Panama.

Trichomanes Krausii Hook. & Grev. Plants slender, forming loose mats or colonies; fronds 2–6 cm. long, divided into numerous linear pinnae.—Frequent on logs, branches, or tree trunks in wet forest; widely distributed in tropical America.

Trichomanes Martinezii Rovirosa. Plants slender but large and creeping along tree trunks; fronds mostly 20–30 cm. long, bipinnatifid.—Common on small trees in wet forest, often creeping for several meters; extending to southern Mexico.

Trichomanes polypodioides L. Rhizomes filiform; fronds distant, pendent, 10–25 cm. long, delicate, linear to linear-lanceolate, coarsely sinuate-lobate.—Growing on a tree fern trunk in wet forest; widely distributed in tropical America.

Trichomanes sphenoides Kunze. Plants forming dense colonies; sterile fronds roundish, 5–10 mm. broad, entire; fertile fronds 1–2 cm. long, broadly oblong-obovate.—On tree trunks in wet mountain forest; widely distributed in tropical America.

SALVINIACEAE. Salvinia Family

The group consists of small aquatic plants, floating upon the surface of water. They have roots or rootlike leaves, and opposite or alternate, apparently 2-ranked leaves.

AZOLLA Lam.

Azolla caroliniana Willd. Plants very small, usually 1–2 cm. broad, fernlike, alternately branched, finely hairy, the minute leaves imbricated, 2-lobed.—Occasional on quiet water about Tela; widely dispersed in tropical America.

SALVINIA Schreb.

Salvinia auriculata A. Br. Fronds about 15 mm. long, oval or oblong, folded at first, auricled at the base, entire, pubescent beneath and strigose above.—Floating on quiet water; common in the river at Tela and abundant in the Toloa Swamp; widely distributed in tropical America.

LYCOPODIACEAE. Clubmoss Family

LYCOPODIUM L.

Lycopodium cernuum L. Plants terrestrial, erect or arching branched; leaves spirally arranged in many ranks, subulate-attenuate, about 4 mm. long; strobiles numerous, recurved, mostly 1–2 cm. long.—On brushy slopes near Puerto Arturo; widely distributed in tropical regions.

Lycopodium linifolium L. A pendent flaccid epiphyte, dichotomously branched, the branches very slender; leaves spreading, linear-lanceolate, 12–25 mm. long.—Growing on trees in wet forest on the hills high above Lancetilla; widely distributed in tropical America.

SELAGINELLACEAE. Selaginella Family

SELAGINELLA Beauv.

Slender terrestrial plants with slender, prostrate to erect stems, producing elongated wiry rootlike rhizophores at some or all of the joints; leaves minute, 1-nerved, apparently alternate, all nearly alike or of two kinds.

Selaginella costaricensis Hieron. A slender erect plant, 30–60 cm. high; leaves of two sorts.—In wet forest near Lancetilla; extending to Costa Rica.

Selaginella flabellata (L.) Spring. Plants erect, rooting at the base, about 30 cm. high, bright green.—Common in wet forest above Lancetilla; widely distributed in tropical America.

Selaginella Poeppigiana (Hook. & Grev.) Spring. Plants low, ascending, forming loose colonies, pale yellowish green, with copious long rhizophores.—Frequent in wet forest or in thickets; widely distributed in tropical America.

Selaginella umbrosa Lam. Plants erect, frondlike, the slender stems bright red; leaves very short and crowded, beautifully ciliate.—Common in wet forest; widely distributed in tropical America.

PSILOTACEAE. Psilotum Family

PSILOTUM Sw.

Psilotum nudum (L.) Griseb. A small epiphytic plant, simple below, dichotomous above, the stems slender, compressed, 3-sided; leaves minute, 1 mm. long or less; sporangia uniform, depressed-globose, dehiscing by 3 vertical valves.—On tree trunks, apparently infrequent here; widely distributed in the tropics of both hemispheres.

CYCADACEAE. Cycad Family

ZAMIA L.

Several species of these palmlike plants grow in the forests of Central America. They have short and thick trunks or are stemless; their leaves are pinnate, with thick rigid segments which are jointed at the base. The flowers and fruits are arranged in large cones, the two sexes upon separate plants.

Zamia furfuracea L. f. *Camotillo.* Plants stemless, small, the long leaves with numerous narrow leaflets, these linear or nearly so,

seldom more than 2 cm. wide, with small spiny teeth at least toward the tip; petioles prickly.—Occasional in brushy places; extending northward to southern Mexico. This plant is widely known in Central America, at least by reputation. There is a common report that the thick starchy roots are used for criminal poisoning, a report which probably is true. It is stated, further, that if the roots have been out of the ground three days before being administered, they cause death in three days; if dug ten days, they kill in ten days, and so on. The accuracy of this belief is open to question, to say the least. The poisonous properties of *Zamia* roots have long been known. The poisonous principle, however, is destroyed by heat, at least in some species, and the roots formerly were an important food among the aborigines of the Florida Peninsula, to whom they were known by a name which usually is reported as "coontie."

Zamia Tuerckheimii Donn. Smith. Plants large, with a short thick trunk; petioles bearing few short sharp prickles; leaflets few, obovate or oblanceolate, as much as 9 cm. wide, acuminate, entire.—Seen in this region only on the tops of the hills above Tela, where it seemed to be rare; occurring also in Guatemala.

TYPHACEAE. Cat-tail Family

TYPHA L.

Typha angustifolia L. *Enea. Cat-tail.* A coarse perennial herb with long narrow leaves; flowers minute, forming dense stout brownish spikes.—Abundant in marshes; widely distributed in tropical regions. The leaves are used in Honduras for making mats and other articles. The fluff from the fruiting spikes is employed for stuffing pillows and cushions.

POTAMOGETONACEAE. Pondweed Family

These plants are glabrous aquatic herbs with branched stems and alternate thin entire leaves. The flowers are small and green, with a perianth of 4–6 small segments or with none. The stamens are 1–6, and the ovaries are 1–6 and distinct, the fruits being small, dry, and indehiscent.

RUPPIA L.

Ruppia maritima L. *Ditch-grass.* Plants much branched; leaves linear-filiform, less than 1 mm. wide; fruits ovoid, pointed, scarcely 2 mm. long, on slender stalks.—Growing submerged in salt

water along the coast; widely distributed in salt or brackish water over the greater part of the earth.

ZOSTERA L.

Zostera marina L. *Eel-grass.* Leaves very long, 6–10 mm. wide; fruit an utricle which bursts irregularly; sterile flowers with a single stamen, the anther containing a tuft of threads in place of ordinary pollen.—Common in the sea along the coast; widely distributed in tropical and temperate regions.—So far as I know, this plant has not been reported previously from Central America, but it must grow all along both coasts. The leaves often are cast upon the beach by the waves.

ALISMACEAE. Water-plantain Family

These plants are scapose herbs, glabrous or nearly so, the large leaves all basal, long-stalked, entire, and several-nerved. The white flowers are arranged in panicles or racemes and have 3 petals which are very thin and soon wither. The fruit is a dense head of numerous small achenes.

ECHINODORUS L. Rich.

Echinodorus macrophyllus (Kunth) Micheli. A coarse herb sometimes 1.5 meters high; leaves very large, shallowly cordate at the base, usually rough-hairy beneath along the nerves; flowers in large panicles; fruit heads scarcely 1 cm. in diameter.—Abundant in marshes; widely dispersed in tropical America.

SAGITTARIA L.

Sagittaria latifolia Willd. *Arrowhead.* A coarse glabrous herb about a meter high; leaves arrow-shaped, the basal lobes long and tapering; fruit heads more than 1 cm. in diameter.—Frequent in shallow water in open places; ranging northward through most of the United States.

TRIURIDACEAE. Triuris Family

SCIAPHILA Blume

Sciaphila picta Miers. A slender glabrous saprophytic herb, without chlorophyll, 25 cm. high or less, the stem simple, flexuous, the whole plant dark red; leaves represented by small bracts; flowers forming a long slender raceme, minute, the pedicels recurved; perianth

6-parted, the segments reflexed, villous at the tip; flowers of separate sexes on the same plant; anthers sessile; fruit a globose cluster of numerous minute globose carpels.—Frequent on decaying leaves in deep cohune palm forests; known also from Panama and Colombia. The genus has not been reported previously north of Panama. The family is represented in Guatemala by a single species of the genus *Triuris*. The plants are hard to find, until one is familiar with them, but the present species may be found almost anywhere in the darker forest on the hills above Lancetilla.

GRAMINEAE. Grass Family

The group is one of the largest families of Central American plants, being represented, according to a recent enumeration,[1] by no fewer than 115 genera and 460 species. In the tropical lowlands grasses form a far less important part of the vegetation than in temperate regions, nor is the number of species so great as in cooler climates.

ANDROPOGON L.

These are erect perennials, often growing in clumps, with narrow leaves. The spikelets are arranged in racemes, inserted in pairs at each node of a jointed rachis, one of the spikelets being sessile and perfect, the other pediceled. The fertile lemma usually bears an awn at its apex.

Andropogon bicornis L. *Cola de venado.* Plants large and coarse, forming dense clumps a meter high or more; leaves 2–5 mm. wide; inflorescence feathery with long soft hairs.—Occasional in fields and on brushy slopes; widely distributed in tropical America. Called "rabo de venado" in Panama.

Andropogon nodosus (Willem.) Nash has been grown in experimental plots at Lancetilla. It is an Old World plant, and there is no reason for including it in the Central American flora as has been done by Hitchcock in the paper cited above. The only specimens known from Central America are those obtained by the writer, the label of which plainly states that the specimens are from cultivated plants.

Andropogon semiberbis (Nees) Kunth. Plants tall and slender, growing in small dense clumps; leaves flat, 2–4 mm. wide; inflorescence with short and inconspicuous hairs.—Frequent in sandy thickets near the seashore; widely distributed in the tropics of both hemispheres.

[1] A. S. Hitchcock, The grasses of Central America. Contr. U. S. Nat. Herb. 24, part 9. 1930.

ANTHEPHORA Schreb.

Anthephora hermaphrodita (L.) Kuntze. *Cabeza de negro.* Plants annual, erect or ascending, glabrous; blades flat, 5–10 mm. wide; inflorescence of dense spikes 5–10 cm. long, the spikelets in clusters of 4, the first glumes much thickened and hardened, the glumes rigid, short-awned.—Frequent in sand near the seashore; widely dispersed in tropical America.

AXONOPUS Beauv.

Axonopus compressus (Sw.) Beauv. *Carpet grass.* A nearly glabrous, low perennial, sometimes producing long stolons; leaves 8–10 mm. wide, short, obtuse; spikelets minute, arranged in long linear spikelike racemes, which are arranged in clusters of 2–5.—Common in open fields; widely distributed in tropical America. Called "grama" in Salvador.

Several species of bamboos (*Bambusa*) are in cultivation at Lancetilla. The common bamboo, *B. vulgaris* Schrad., is grown commonly in many parts of Central America, its large stems being used for a wide variety of purposes.

CENCHRUS L. Sandbur

These grasses are easily recognized by their hard spiny spikelets, resembling burs, which adhere tightly to any object with which they come in contact. They are pernicious weeds, are all too widely and unfavorably known in many parts of the United States.

Cenchrus echinatus L. *Cabeza de negro.* A coarse, erect or decumbent annual; leaves 3–8 mm. wide; burs with a ring of slender bristles at the base.—Common in fields or in coastal thickets; widely distributed in tropical America. Called "mozote" in Salvador, and in Panama "cadillo" and "pega-pega."

Cenchrus pauciflorus Benth. *Cabeza de negro.* Burs covered with coarse stout spines, without a ring of bristles at the base.—Common in sandy places near the beach; widely distributed in tropical America. Sometimes known in Salvador by the name "abrojo."

CHLORIS Sw.

Plants annual or perennial, with flat blades; spikelets with only one perfect floret, sessile in 2 rows along one side of a rachis, the spikes clustered at the summit of the culm.

Chloris inflata Link. Plants annual, tufted, 30–60 cm. high; spikes about 10, purplish; awns 5–8 mm. long.—Occasional in open places; widely distributed in tropical America.

Chloris petraea Sw. Perennial, glabrous and glaucous; leaves obtuse; spikes few, the fertile lemma not awned; leaf sheaths conspicuously compressed and keeled.—Growing in sand near the beach; ranging from Panama to the United States.

Chloris radiata (L.) Sw. An annual, erect or spreading; blades scabrous or pubescent; spikes numerous, dense, pale green; awn of the fertile lemma 5–10 mm. long.—Occasional in open grassy places; generally distributed in the American tropics.

COIX L.

Coix Lachryma-jobi L. *Lágrimas de San Pedro. Job's tears.* A tall coarse grass, often 1.5 meters high, forming dense clumps; leaves 2–3 cm. wide; fruits large, oval, white or grayish, smooth and shining.—Occasional in open swampy places; a native of the Old World, but now naturalized extensively in tropical America. Sometimes called "zacate de perla" in Salvador. Easily recognized by the beadlike fruits or "seeds," which are used for making bracelets, necklaces, and other articles.

CYMBOPOGON Spreng.

Cymbopogon citratus (DC.) Stapf. *Zacate limón, Zacate de té. Lemon grass.* A coarse perennial, forming dense clumps; leaves glabrous, 5–15 mm. wide, pale beneath.—Cultivated commonly, and often escaping; native of the Old World tropics, but naturalized in many parts of the American tropics. Sometimes called "hierba de limón." This grass, which seems never to flower in Central America, may be recognized by its strong lemon odor. Tea made from the leaves is administered frequently to produce perspiration. In India the plant is grown as the source of the aromatic lemon oil, which is an article of commerce.

CYNODON Pers.

Cynodon Dactylon (L.) Pers. *Bermuda grass.* A creeping perennial, forming a dense sod; leaves short and narrow; spikelets minute, 1-flowered, awnless, sessile in 2 rows along one side of a slender rachis, the spikes clustered at the top of the culm.—Common in open places; native of the Old World, but now established nearly

everywhere in tropical America. Known in Salvador by the names "zacate de conejo," "zacate agujilla," and "grama de gallina." Bermuda grass is often planted for lawns in tropical America, and is very satisfactory for the purpose, but in cultivated ground it becomes an indomitable pest.

DACTYLOCTENIUM Willd.

Dactyloctenium aegyptium (L.) Willd. *Crowfoot grass.* An annual, more or less hairy, often producing stolons; leaves flat, 5 mm. wide; spikelets 3–5-flowered, sessile in 2 rows along one side of the short rachis, the 2–4 short thick spikes clustered at the top of the culm.—In thickets or open places along the seashore, infrequent here, but widely naturalized in America; native of the Old World.

DIGITARIA Heist. Crabgrass

Plants slender, annual or perennial; spikelets solitary or in 2's or 3's in 2 rows along one side of the slender rachis, the slender spikelike racemes clustered at the end of the culm.

Digitaria horizontalis Willd. An erect or procumbent annual; rachis of the raceme bearing scattered long pale delicate hairs; spikelets 2 mm. long.—Frequent in thickets or open places, sometimes a weed in cultivated ground; distributed through the tropics of both hemispheres.

Digitaria sanguinalis (L.) Scop. Rachis of the raceme without long hairs; spikelets 3 mm. long.—Common in thickets and fields; widely distributed in both hemispheres; a common weed of the United States.

ECHINOCHLOA Beauv.

Echinochloa colonum (L.) Link. A tall or low annual; leaves 3–10 mm. wide, often with cross bands of purple; spikelets in short racemes, these arranged in small dense panicles; awn reduced to a short point.—Occasional in wet soil, often growing in shallow water; ranging through the tropics of both hemispheres.

ELEUSINE Gaertn.

Eleusine indica (L.) Gaertn. *Yard grass.* An erect or spreading annual, the culms flattened; leaves flat; spikelets few-flowered, sessile in 2 rows along one side of a broad rachis; spikes several, 5–10 cm. long, clustered at the top of the culm.—A frequent weed in fields and

cultivated ground; native of the Old World, but widely naturalized in the Americas. Called "cola de gallo" and "cola de burro" in Salvador.

ERAGROSTIS Host

Plants annual or perennial; spikelets few- to many-flowered, the florets closely imbricated; inflorescence an open or contracted panicle.

Eragrostis amabilis (L.) Wight. & Arn. A small, erect or spreading, very slender annual; spikelets 2 mm. long, pediceled, arranged in broad open panicles 5–15 cm. long.—A weed in gardens and waste ground; introduced from the Old World into many parts of the American tropics.

Eragrostis ciliaris (L.) Link. A slender erect annual; leaves 1–3 mm. wide; spikelets nearly sessile, 2 mm. long, 6–8-flowered, forming dense spikelike panicles 5–15 cm. long.—Frequent in thickets and waste ground; widely distributed in the tropics of the world; one of the common weeds of tropical America. Called "ilusión" in Salvador.

Eragrostis mexicana (Lag.) Link. An erect or spreading annual, sometimes up to 1 meter tall; panicles 15–20 cm. long, sometimes drooping, the lower axils pilose; spikelets linear-oblong, 5–7 mm. long, 8–12-flowered.—A common weed in gardens and waste places; widely distributed in tropical America.

Eragrostis tephrosanthos Schult. An erect or spreading annual; panicles oblong, open, often half the height of the whole plant; spikelets 6–12-flowered, 4–6 mm. long.—Frequent in open fields; widely dispersed in tropical America.

GUADUA Kunth

Guadua aculeata Rupr. *Tarro.* A very large plant, resembling in its habit of growth and general aspect the common bamboo; culms sometimes 15 meters high and 15 cm. or more in diameter; young branches armed with short stout recurved spines.—Abundant in swamps at low elevations, and often forming extensive groves; ranging from Guatemala to Panama. This is a very fine and handsome grass, notable for its graceful habit. It is one of the conspicuous features of the landscape in the coastal regions of Guatemala and Honduras. The young shoots are very large and thick when they issue from the ground, and they grow with astounding rapidity. At first

they are naked poles, but when they have attained their full height, they send out many slender feathery lateral branches full of leaves. This bamboo often forms dense thickets, which are almost impenetrable because of the spiny stems. The larger stems are used like those of bamboo for the walls and rafters of huts, and for many other purposes. Sections of them are used at Lancetilla as flower pots. In the region I saw one hut whose sides were made of the stems of this bamboo which had been flattened out, and were nailed down like boards. Such a type of construction is very rare in Central America, although well known in some regions of South America, whence this particular hut perhaps had received its inspiration.

GYNERIUM Willd.

Gynerium sagittatum (Aubl.) Beauv. *Caña brava.* A tall coarse grass, often 7 meters high and sometimes as much as 10 meters; blades as much as 2 meters long and 4–6 cm. wide; panicles pale, plumelike, 1 meter long or more.—Common in swamps and along streams, often forming dense thickets; widely dispersed in tropical America. The plant is an important one in Central America because it is used very extensively for the construction of huts in the lowlands. It is transported in large quantities also into the interior, where it is employed as a substitute for laths in the construction of houses of the better type.

ICHNANTHUS Beauv.

Plants low, the culms usually rooting at the nodes; leaves short and broad, flat; spikelets panicled; fruit acute or acutish; plants similar to some of the species of *Panicum.*

Ichnanthus axillaris (Nees) Hitchc. & Chase. Leaves cordate-clasping at the base, oval to ovate-lanceolate, frequently scabrous on the upper surface and pubescent beneath; spikelets often sparsely pilose.—Frequent in wet thickets, the plants often forming dense patches; widely distributed in tropical America.

Ichnanthus pallens (Sw.) Munro. Stems decumbent or creeping and sometimes 1.5 meters long; leaves lanceolate, glabrous or nearly so, 1–2 cm. wide; panicles 5–10 cm. long; spikelets 3–3.5 mm. long.—Common in wet forest and thickets; widely distributed in tropical America. The stems often clamber over shrubs or other plants.

IXOPHORUS Schlecht.

Ixophorus unisetus (Presl) Schlecht. *Zacate dulce.* A coarse annual about a meter high; leaves 2–4 cm. wide; spikelets long-awned,

in very numerous spikelike racemes, these arranged along a long rachis and forming a panicle-like inflorescence.—Frequent in open places; distributed from Mexico to Colombia. Known in Salvador by the names "zacate hondureño," "zacate de Honduras," "mesmeto," and "zacate de conejo."

LASIACIS (Griseb.) Hitchc.

Grasses of this genus are very common in Central America, especially in the lowlands. They are large, often somewhat shrubby plants, usually with much-branched and climbing or clambering, slender stems, the leaves short and flat, commonly lanceolate, and narrowed into a petiole. The subglobose spikelets, similar to those of the genus *Panicum* (with which *Lasiacis* formerly was united) are arranged in small or large panicles.

Lasiacis divaricata (L.) Hitchc. *Carrizo.* A slender vine sometimes 3 meters long, glabrous almost throughout; leaves 5–12 cm. long and 5–15 mm. wide; ligule inconspicuous; panicles few-flowered, 5–10 cm. long; spikelets ovoid, 4 mm. long.—Common in wet thickets; widely dispersed in tropical America.

Lasiacis Grisebachii (Nash) Hitchc. Main stems creeping, rooting at the joints, the fertile branches erect or ascending, 20–40 cm. tall, pubescent or glabrate; leaves 8–12 cm. long, 1–1.5 cm. wide; ligule 3–5 mm. long; panicles 5–6 cm. long; spikelets ovoid, 4 mm. long.—Occasional in thickets; also in Mexico and Cuba; not collected elsewhere in Central America.

Lasiacis oaxacensis (Steud.) Hitchc. Plants subscandent, 1–2 meters long, glabrous or nearly so; ligule 2–5 mm. long; leaves 10–25 cm. long, 1–2 cm. wide, scabrous; panicles open, sometimes 30 cm. long and nearly as wide; spikelets elliptic, 4 mm. long.—In wet thickets; ranging from Mexico to Ecuador.

Lasiacis ruscifolia (HBK.) Hitchc. & Chase. *Carrizo.* Plants subscandent, often 2 meters long; ligule inconspicuous; leaves 10–15 cm. long, 3–6 cm. wide, glabrous or puberulent; panicles 5–20 cm. long, usually narrow and compact; spikelets globose, 3–4 mm. long.—Common in wet thickets and forest; widely distributed in tropical America.

LEERSIA Sw.

Leersia hexandra Sw. An erect perennial, about a meter high or sometimes taller, rough; leaves about 8 mm. wide; spikelets 1-

flowered, laterally compressed, arranged in many-flowered panicles. —Growing in shallow water at the edge of streams; widely dispersed in tropical America, and extending to the United States.

LEPTOCHLOA Beauv.

Plants annual or perennial, with long narrow flat leaves; spikelets 2–several-flowered, sessile or short-pediceled, arranged along one side of a slender rachis, the racemes forming a long or short panicle.

Leptochloa filiformis (Lam.) Beauv. Plants annual, mostly 60 cm. high or less, slender; leaves thin and flat, the sheaths pilose.—Common in fields and thickets; widely distributed in tropical America. Called "cola de buey" in Salvador.

Leptochloa virgata (L.) Beauv. Perennial, tall, slender, the leaves 1 cm. wide, glabrous like the sheaths; racemes about 10 cm. long, very slender, numerous, forming a large panicle.—A frequent weed in waste ground; generally distributed in tropical America. Known in Salvador by the name "cola de buey."

LITHACHNE Beauv.

Lithachne pauciflora (Sw.) Beauv. A perennial, usually about 30 cm. high, forming isolated dense clumps, the culms hard and wiry; leaves flat, lanceolate, about 6 cm. long and 2 cm. wide, glabrous or nearly so; spikelets in very small, axillary panicles produced from the upper sheaths; fruits 4–5 mm. long, white.—Frequent in wet thickets; extending from Mexico to Argentina. Easily recognized by the large hard white fruits and distinctive habit.

Melinis minutiflora Beauv. is in cultivation at Lancetilla, and may become established in the region, as it is in some other parts of Central America. It is sometimes called molasses grass, and in Salvador it is known by the name "zacate gordura." Its general dispersal in Central America would be of a certain advantage to the region, since it is claimed that ticks never exist where this grass grows.

OLYRA L.

Olyra latifolia L. *Carrizo.* A coarse perennial, the rather slender culms often 3 meters long, frequently clambering; leaves large and broad, 4–8 cm. wide and 15–30 cm. long; spikelets 1-flowered, in terminal panicles 10–15 cm. long; second glume and sterile lemma long-pointed; fruit 5–6 mm. long, white or gray, smooth and shining

like porcelain.—Common in wet forest; generally distributed in tropical America. Called "carricillo" in Panama, and "carrizo montés" in Salvador.

OPLISMENUS Beauv.

Oplismenus hirtellus (L.) Beauv. A slender perennial grass with much-branched and widely creeping culms; sheaths glabrous or hairy, the blades 5–10 cm. long and 1–2 cm. wide; spikelets long-awned, arranged in 3–7 short racemes which are scattered along a long slender rachis, the awns often purplish.—Common in wet thickets; occurring in most regions of tropical America.

Oplismenus Burmannii (Retz.) Beauv., one of the most abundant weeds of Central America, strangely enough was not observed by the writer in the Tela region.

ORTHOCLADA Beauv.

Orthoclada laxa (L. Rich.) Beauv. A large perennial, about a meter high, producing stolons; leaves lanceolate, 12–15 cm. long, 2.5 cm. wide; spikelets 1-flowered, 6–7 mm. long, the lemmas acuminate or short-awned, arranged in large diffuse panicles.—Occasional in wet forest; ranging from Mexico to Peru.

ORYZA L.

Tall coarse grasses with broad flat leaves; spikelets 1-flowered, laterally compressed, arranged in large open panicles.

Oryza latifolia Desv. Perennial, sometimes 2 meters high; leaves 4–5 cm. wide; spikelets 5 mm. long, long-awned.—In wet thickets or in shallow water along streams; generally distributed in tropical America.

Oryza sativa L. *Arroz. Rice.* This important cereal is grown in many parts of Central America upon a large scale, the upland varieties, which grow in well-drained soil under ordinary methods of cultivation, being planted. Rice is one of the three chief food staples of the region. In the Tela region it is grown only on a small scale.

PANICUM L.

One of the largest genera of grasses, the plants very diverse in habit; spikelets 1-flowered, arranged in panicles or rarely in racemes.

Panicum barbinode Trin. *Pará, Zacate Pará. Para grass.* A coarse perennial with very long, creeping stolons, these sometimes

2–6 meters long or more; nodes densely villous, like the sheaths, the blades 10–15 mm. wide, glabrous; panicles 12–20 cm. long, with several distant short racemes.—Common in wet places; abundant in the tropics of both hemispheres. This is one of the two most important forage grasses of Central America, and is encouraged everywhere on that account. The grass often is cut and fed as fodder to stock. Frequently it forms extensive and much tangled, almost impenetrable thickets. Sometimes called "zacate corredor" in Salvador.

Panicum fasciculatum Sw. *Zacate de milpa.* An erect or spreading annual, less than a meter high; sheaths glabrous or hairy, the blades 6–20 mm. wide, flat, glabrous or hairy; panicles 10–20 cm. long, composed of several slender racemes 5–10 cm. long; spikelets 2–2.5 mm. long, purplish, brown, or yellow.—Common in fields, and often in cultivated ground; generally distributed in tropical America. Called "espigadilla" and "granadilla" in Panama.

Panicum grande Hitchc. & Chase. A coarse perennial, sometimes 2 meters high, producing large, creeping or floating stolons, the nodes densely hairy; blades flat, very long, up to 6 cm. wide, glabrous; panicles lax and open, often 60 cm. long; spikelets 2.5 mm. long, pointed, glabrous.—Growing in shallow water along streams and in marshes, frequently forming large and conspicuous colonies; ranging southward to Brazil, but not known north of Honduras.

Panicum hirsutum Sw. A coarse annual, erect, sometimes 1.5 meters high; sheaths hirsute, the blades flat, glabrous or nearly so, 2–3.5 cm. wide; panicles large, open, 20–35 cm. long; spikelets 2 mm. long, acute, glabrous.—Growing in thickets and marshes, or as a weed in gardens; generally distributed in tropical America.

Panicum laxum Sw. Plants annual, very slender, erect or spreading; leaves 5–15 mm. wide; panicles 5–30 cm. long, composed of numerous slender spreading racemes; spikelets 1–1.5 mm. long, acutish.—Frequent in wet fields or in cultivated ground; generally distributed in tropical America.

Panicum maximum Jacq. *Guinea, Zacate Guinea. Guinea grass.* An erect perennial, commonly 1–1.5 meters high, forming dense clumps, the nodes hirsute; blades 1–3.5 cm. wide, glabrous or hairy; panicles open, large, up to 50 cm. long, the spikelets oblong, glabrous, 3 mm. long.—Common in open places; widely distributed in the tropics of both hemispheres, and often cultivated. Known in Salvador by the names "zacate barqueño," "zacate de barco," and "zacate de la India." Guinea grass is the most important pasture grass of

Central America, large areas being devoted to it at low and middle elevations. It is a rank-growing plant, sometimes as tall as the cattle which feed on it. A well-grown field is so dense that it is difficult to force one's way through it, something that one feels less inclined to do because of the knowledge that ticks are almost certain to be found in great abundance inhabiting the leaves and stems.

Panicum pilosum Sw. A rather low perennial, the culms often rooting at the nodes; nodes usually villous; blades 4–20 cm. long and 7–15 mm. wide, broad at the base; panicles 5–15 cm. long, composed of 10–20 short spikelike racemes; spikelets 1.5 mm. long, glabrous.—A weed in gardens; generally dispersed in tropical America.

Panicum polygonatum Schrad. A slender perennial, the culms spreading or creeping, sometimes as much as a meter long, the nodes densely pubescent; blades 3–13 cm. long and 8–15 mm. wide, cordate at the base; panicles 7–20 cm. long, composed of few secund spikelike racemes; spikelets 1.5 mm. long, pointed, glabrous.—Common in wet thickets or in marshy fields; ranging from Mexico to Paraguay.

Panicum stagnatile Hitchc. & Chase. A coarse perennial, the stems erect or reclining, 1–1.5 meters long, glabrous or with the lower nodes appressed-pubescent, the sheaths glabrous; blades 1.5–3 cm. wide, glabrous; panicles open and much branched, 20–40 cm. long, the spikelets glabrous, acute, 1.8 mm. long.—Growing in wooded swamps near the coast; extending from Panama to Mexico.

Panicum stoloniferum Poir. A slender decumbent branched perennial; blades small, flat, 1–5 cm. long, 5–15 mm. wide; panicles 1–5 cm. long, composed of few very short racemes; spikelets 2.5 mm. long, glabrous.—In wooded swamps; distributed from Guatemala to South America.

Panicum trichanthum Nees. A slender perennial, the straggling culms branched; blades 10–15 cm. long, 1–1.5 cm. wide, cordate at the base; panicles open and many-flowered, 10–30 cm. long, the spikelets elliptic, acute, 1.5 mm. long.—Common in fields and thickets; generally distributed in tropical America. A rather weedy plant, the stems sometimes as much as 1.5 meters long, and clambering over other plants.

Panicum trichoides Sw. An annual with much-branched stems, erect or spreading, the sheaths hirsute; blades short and broad, 2–6 cm. long, 1–2 cm. wide, cordate at the base, glabrous or hairy; panicles open, many-flowered, 5–10 cm. long, with capillary branches; spikelets ellipsoid, 1.3 mm. long, pubescent.—A common weed in

thickets, fields, and cultivated ground; occurring throughout tropical America, and one of the most abundant weeds of Central America.

PASPALUM L.

This is another of the largest groups of American grasses, being represented in Central America by 67 species. The plants are annuals or perennials, the spikelets plano-convex, 1-flowered, usually obtuse, subsessile, solitary or in pairs, and arranged in two rows along one side of a narrow or dilated rachis. The racemes are solitary or paired at the summit of the culm, or arranged racemosely along its upper portion.

Paspalum ciliatifolium Michx. A slender perennial, forming tufts, the culms glabrous; blades flat, 10–20 cm. long, 7–12 mm. wide; racemes 1–3, mostly 7–10 cm. long; spikelets in pairs, 2 mm. long, glabrous or minutely pubescent.—On sandy beaches near Tela; occurring also in the West Indies and the southern United States, but not known elsewhere in Central America.

Paspalum conjugatum Berg. A widely creeping perennial, often forming large colonies; blades flat, 5–15 mm. wide, glabrous or occasionally pubescent; racemes 2, widely spreading, 8–14 cm. long; spikelets solitary, ovate, pale yellow, 1.4–1.8 mm. long, glabrous except for the ciliate margin.—A common weed in open places; widely dispersed in the tropics of both hemispheres. One of the common weedy grasses of the lowlands of Central America.

Paspalum fasciculatum Willd. *Gamalote, Camalote.* A very large and coarse perennial, the stems sometimes several meters long, often forming dense thickets, the flowering culms 2 meters high or even taller; blades 1.5–3 cm. wide; panicles composed of 12–20 racemes 10–15 cm. long, aggregated on a short axis; spikelets solitary, 4–4.5 mm. long, elliptic, silky on the margin.—Abundant in marshy or swampy places, especially toward the Ulua River; widely distributed in tropical America. Called "camalote" and "camalote negro" in Salvador. This grass is plentiful in many parts of the Tela region, forming pure stands of great extent. Its growth is so dense that it is hard to push one's way through the tangles, in which the heat is almost overpowering.

Paspalum Langei (Fourn.) Nash. A slender, usually rather low perennial; leaves flat, thin, 10–40 cm. long, 6–15 mm. wide; racemes 2–5, slender, 5–10 cm. long; spikelets olive-green, turning brown, 2.5 mm. long.—Collected in thickets at La Ceiba, and doubtless

occurring in the Tela region; extending to Venezuela and the United States.

Paspalum microstachyum Presl. A very slender, branching annual, erect or ascending; blades flat, 6–20 mm. wide, glabrous or hairy; racemes 6–35, scattered distantly along the rachis, 3–8 cm. long; spikelets in pairs, elliptic, pubescent, 1.5 mm. long.—Common in fields and thickets; ranging from Guatemala to South America.

Paspalum millegrana Schrad. A coarse erect perennial, glabrous, 1–2 meters tall; leaves 1.5 cm. wide; panicles composed of 12–25 stout ascending racemes 6–15 cm. long; spikelets glabrous, 2–2.4 mm. long.—In marshes; ranging to Brazil.

Paspalum notatum Flügge. A low perennial, 50 cm. high or less, forming small dense clumps; leaves 3–10 mm. wide; racemes 2, mostly 4–7 cm. long; spikelets solitary, glabrous, 2.5–3.5 mm. long.—In pastures and open places; generally distributed in tropical America.

Paspalum orbiculatum Poir. A small creeping perennial, often forming dense mats; leaves flat, 1–6 cm. long, 2–7 mm. wide; racemes 3–4, short, only 1–2 cm. long; spikelets solitary, depressed-hemispheric, commonly glabrous, 1 mm. long.—In wet fields and thickets; widely distributed in tropical America.

Paspalum paniculatum L. A coarse tall perennial, often a meter high, forming dense clumps; leaves flat, 1–2 cm. wide, stiff-hairy; panicles large, composed of numerous fascicled racemes 5–10 cm. long; spikelets densely crowded, pubescent, 1.3 mm. long.—Common in fields; widely dispersed in the tropics of both hemispheres. Called "camalote" in Salvador. One of the common grasses of Central America. The stiff hairs penetrate the skin easily and painfully.

Paspalum propinquum Nash. Closely related to *P. ciliatifolium*, the blades rarely more than 8 mm. wide; spikelets elliptic-obovate, slightly pointed, 1.8 mm. long.—In sand near the beach about Tela; ranging from Panama to Florida.

PHARUS L.

Perennial grasses, the blades broad and flat, with fine transverse veins between the nerves; spikelets 1-flowered, in pairs along the branches of the open panicles; lemma with a minute bent beak, the back covered with small hooked hairs.

Pharus glaber HBK. *Mozote.* An erect glabrous perennial about 50 cm. high; leaves oblanceolate, long-pointed, 15–25 cm. long, 3–7 cm. wide; spikelets brownish, 1 cm. long; fruit densely covered with hooked hairs.—Common in wet mountain forest; generally dispersed in tropical America. The fruiting panicles break up easily, and the spikelets adhere closely to clothing and other objects with which they come in contact. This species is called "pegapega" in Panama.

Pharus parvifolius Nash. Similar, but the base of the plant creeping and rooting; blades commonly somewhat narrower.—In wet forest or thickets; extending to Costa Rica, Mexico, and the West Indies.

PHRAGMITES Adans.

Phragmites communis Trin. *Carrizo. Reed.* A coarse grass, often 3 meters high, with broad leaves; panicles very large, dense and feathery; spikelets several-flowered, the rachilla covered with long silky hairs.—Common along the larger streams and in marshes, especially near the coast, often forming dense thickets; widely distributed in both hemispheres, in tropical and temperate regions. The large thick canelike stems are used locally for many purposes. Hollow sections of them are employed in making the rockets which form so important a part of all Central American holiday celebrations.

PSEUDECHINOLAENA Stapf

Pseudechinolaena polystachya (HBK.) Stapf. A slender annual, the culms creeping and rooting; leaves broad, lanceolate, 3–6 cm. long, thin; racemes 4–8, along an elongate rachis, 2–3 cm. long, the spikelets loosely arranged, 3–4 mm. long; second glume covered with slender hooked spines.—Common in wet thickets; widely distributed in tropical America and in Africa.

RADDIA Bertol.

Raddia strictiflora (Fourn.) Chase. A slender perennial, 40 cm. tall or less, the nodes puberulent; blades 4–7 cm. long, 1–2 cm. wide, glabrous; panicles narrow and small, the staminate and pistillate spikelets in different panicles; pistillate spikelets 1 cm. long.—In wet forest, scarce; occurring in Mexico, but not known otherwise from Central America.

SACCHARUM L.

Saccharum officinarum L. *Caña de azúcar. Sugar cane.* Sugar cane is not grown on a large scale in the region of Tela, although it

is an important crop in other parts of the Honduran coast, as at La Ceiba. The plant is a native of the Old World tropics, but is grown extensively in most parts of tropical America.

SETARIA Beauv. Foxtail

Annual or perennial grasses, the panicles often dense and spikelike, rarely loose and open; spikelets 1-flowered, subtended by one to several bristles, awnless.

Setaria geniculata (Lam.) Beauv. A rather low perennial; leaves flat, often hairy, 4–8 mm. wide; panicles spikelike, 2–10 cm. long, the bristles yellowish or brownish; spikelets 2–3 mm. long.—A common weed in waste and cultivated ground; generally dispersed in tropical America. One of the most abundant weeds of nearly all parts of Central America. Known in Salvador by the names "gusano" and "gusanito," given in allusion to the caterpillarlike form of the panicles.

Setaria paniculifera (Steud.) Fourn. *Zacate macho.* A coarse perennial, often 2 meters high or more, the sheaths hairy; leaves strongly nerved, up to 10 cm. wide; panicles large and loosely branched.—Frequent in wet thickets; ranging from Mexico to Colombia.

SORGHUM Moench

Sorghum vulgare Pers. *Sorghum.* This well-known grain was observed under cultivation at only one place in the Tela region, but it is grown more commonly in some other parts of Central America, where usually it is called "maicillo." Its chief use is for fodder for cattle and horses. In some parts of the interior of Honduras the seeds are popped like popcorn, for which they are an excellent substitute.

SPOROBOLUS R. Br.

Sporobolus littoralis (Lam.) Kunth. Plants low, erect from long-creeping hard scaly rootstocks; leaves slender, stiff, spreading, sharp-pointed; spikelets 1-flowered, arranged in spikelike panicles 10–15 cm. long.—Common in wet sandy flats along the seashore, often forming large stands; widely distributed in tropical America.

STENOTAPHRUM Trin.

Stenotaphrum secundatum (Walt.) Kuntze. *St. Augustine grass.* A creeping glabrous perennial with long stolons, the sheaths compressed and equitant, the blades short and obtuse; spikelets

imbedded in one side of a corky rachis, this breaking into joints at maturity; racemes 5–10 cm. long.—Growing in thickets along the beach; generally distributed in tropical America.

STREPTOCHAETA Schrad.

Streptochaeta Sodiroana Hack. *Hitchcock grass.* Plants perennial, coarse, about a meter high; leaves large and broad, commonly 6–8 cm. wide, unequal at the base; spikelets large, 1-flowered, 14 mm. long, long-awned, arranged in long and very dense spikes; awns twisted together and remaining attached at the apex of the spike.—Common in wet mountain forest; ranging southward to Ecuador.

TRICHACHNE Nees

Trichachne insularis (L.) Nees. *Talqualtuste.* Plants erect, a meter high or less, slender, perennial, forming small dense clumps; spikelets in slender racemes, these forming a very dense and feathery panicle.—Abundant in open places; generally dispersed in tropical America. Called "zacate amargo" and "cola de buey" in Salvador. The handsome silky inflorescences often are used as decorations in houses and churches. In the Lancetilla region this is perhaps the most common weedy grass, especially in gardens and cut-over land.

TRIPSACUM L.

Tripsacum laxum Nash. Plants coarse and tall, sometimes 5 meters high, the sheaths glabrous; blades up to 9 cm. wide; glabrous or hairy; inflorescences terminal and axillary, the flowers in spike-like racemes, the spikelets of separate sexes.—Frequent in open swamps toward the Ulua River, often forming large dense stands; extending from Mexico to Colombia. The plant has somewhat the aspect of Indian corn.

ZEA L.

Zea Mays L. *Maíz. Maize, Indian corn.* This is the most important food crop of the region, as it is throughout Central America.

CYPERACEAE. Sedge Family

The sedges are grasslike plants of little economic value and of little interest to any except systematic botanists. A few of them are eaten by stock when better forage is lacking. The stems are chiefly triangular and solid, the leaves, when present, 3-ranked, their sheaths

not split; in the grasses the stems are cylindric or flattened and usually hollow, the leaves 2-ranked, their sheaths usually split.

CYPERUS L.

In this genus the scales of the several- or many-flowered spikelets are 2-ranked, and the spikelets contain usually several perfect flowers.

Cyperus articulatus L. A tall coarse perennial; leaves all reduced to short bladeless sheaths at the base of the plant; culms terete and spongy, with cross partitions.—Growing in sand near the beach; widely distributed in tropical America, and also in the Old World. Called "sontul" in Salvador. Easily recognized by the terete spongy leafless stems.

Cyperus caracasanus Kunth. Plants perennial, low; leaves 1–3 mm. wide; spikes forming simple umbels, the spikelets linear, green, 3–8-flowered, 7–10 mm. long.—Frequent in wet fields or on open banks; widely scattered in tropical America. Known in Salvador by the name "coyolillo."

Cyperus compressus L. Plants annual, usually less than 30 cm. high, the leaves 2–3 mm. wide; spikelets few, arranged in short spikes, strongly compressed, green, 1–2.5 cm. long, 3–5 mm. wide, 4–40-flowered.—Common in open places or in thickets; widely distributed in the tropics of the world. A common weedy species of Central America.

Cyperus cyperoides (L.) Kuntze. A tall perennial, the leaves 3–6 mm. wide; spikes simply umbellate, very dense, sometimes sessile, the spikelets 1–3-flowered, green or yellowish.—Growing in sand or in wet soil; a widely distributed, tropical plant.

Cyperus diffusus Vahl. A low perennial; leaves 4–12 mm. wide, bright green; umbels usually compound, the spikelets few or numerous, 1–2 cm. long, 10–24-flowered, green, the scales mucronate.—Common in wet thickets; widely distributed in tropical regions. Called "junquillo" in Panama.

Cyperus ferax L. Rich. A coarse perennial, rarely more than 80 cm. high, the leaves 5–7 mm. wide; umbels compound, the spikelets loosely spicate, linear, subterete, 10–15 mm. long, 1.5 mm. thick, yellow or brown, breaking up into joints at maturity.—Common in fields and in open places, often in cultivated ground; generally dispersed in tropical regions. Known in Panama by the name "junco," and in Salvador as "coyolillo" and "zacate de corona." This is one

of the most abundant weeds of Central America. The plants exhibit great variation in the size, color, and form of the spikelets.

Cyperus giganteus Vahl. Plants coarse, perennial, 1–2 meters tall; leaves reduced to basal sheaths; umbels very large and leafy, the spikes long and lax, the spikelets linear, 1 cm. long or less, 8–14-flowered, straw-colored.—Frequent in marshes, and especially along the borders of streams, usually growing in shallow water; widely distributed in tropical America. In habit and general appearance the plant is much like the famous papyrus of the Nile, to which it is closely related.

Cyperus haspan L. A slender perennial with rhizomes, bright green; leaves mostly short or reduced to bladeless sheaths; umbels compound, lax, the spikelets numerous, 5–15 mm. long, green or reddish, compressed, 10–40-flowered.—Frequent in marshes or wet fields; growing in the warmer regions of both hemispheres. Called "junco" in Panama.

Cyperus ligularis L. A coarse stout perennial, very pale, often forming dense clumps, frequently a meter high; leaves 5–10 mm. wide, thick; spikes arranged in compound umbels, very dense, short, the spikelets 5 mm. long or less, reddish brown.—Frequent, especially along the borders of streams; generally distributed in tropical America, and in Africa. Called "cortadera" in Panama, in allusion to the rough-edged leaves.

Cyperus Luzulae (L.) Retz. A perennial with short hard rhizomes; leaves 3–7 mm. wide; umbels chiefly simple, very dense, the spikelets densely capitate, 3–4 mm. long, 2–3 mm. wide, whitish, 6–10-flowered, strongly compressed, the scales obtuse.—Common in wet fields; generally distributed in tropical America. Known as "junco" in Panama.

Cyperus ochraceus Vahl. Plants perennial, low or tall and rather stout, the blades narrow; umbel with numerous long rays, the spikelets densely capitate at the ends of the rays, oblong, pale green, many-flowered.—In wet thickets or open fields; widely distributed in tropical America.

Cyperus oxycarioides Britton. Plants coarse, perennial; leaves 3–8 mm. wide; spikes very dense and congested, forming a headlike inflorescence, the spikelets linear, subterete, 6–10 mm. long, 8–12-flowered, the scales obtuse.—In weedy fields; occurring also in Guatemala and in Texas.

Cyperus paniculatus Rottb. Plants annual, very slender, tufted, 20 cm. high or less, the leaves 1–3 mm. wide; spikes in umbels, short, lax, the spikelets linear, compressed, 5–12 mm. long, the scales obtuse, green or yellowish; style 2-cleft.—In wet fields or in wet sand near the beach, often in salt flats, frequent; widely distributed in the tropics.

Cyperus rotundus L. A low perennial with long rhizomes, the culms bulbous-thickened at the base; leaves 3–6 mm. wide; spikes lax, in umbels, the spikelets few, linear, 1–2 cm. long, 20–30-flowered, dark brown, the scales obtuse, closely appressed.—On sandy open banks, scarce; widely dispersed in the tropics of both hemispheres.

Cyperus surinamensis Rottb. Plants perennial, sometimes 60 cm. high; leaves 2–3 mm. wide; umbels simple or compound, the spikelets numerous, green, 4–11 mm. long, 2–3 mm. wide, 30–40-flowered, crowded in small dense heads.—Frequent in wet fields; generally distributed in tropical America.

DICHROMENA Michx.

Dichromena radicans Schlecht. & Cham. A low slender tufted perennial about 30 cm. high; leaves numerous, rather broad, glabrous or pubescent; spikelets few, 1 cm. long or less, pointed, slightly compressed, whitish, few-flowered, crowded in a dense head which is surrounded by large leaflike bracts; achene lenticular, capped by the persistent style base.—Frequent in open fields or in thickets; generally distributed in tropical America. Two other species are known from Central America, and both are to be expected in this region.

ELEOCHARIS R. Br. Spike rush

The species are easily recognized by their leafless stems and solitary terminal spikelets. All the leaves are reduced to sheaths, which are in evidence near the base of the usually terete culm. The style base is persistent as a tubercle on the apex of the achene.

Eleocharis caribaea (Rottb.) Blake. Plants annual; culms very slender and filiform but stiff, 5–30 cm. high; spikelet obtuse, 3–5 mm. long, the scales pale or dark brown, scarious-margined; achene obovate, black, smooth and shining, the tubercle minute, depressed. —In marshy fields, sometimes forming dense colonies; general in tropical regions.

Eleocharis geniculata (L.) R. Br. Plants perennial, tall, coarse, sometimes a meter high, the culms 3–8 mm. thick, with trans-

verse partitions, soft and spongy; spikelet 1–3 cm. long, 5–9 mm. thick, the scales thin, brown; achene trigonous, smooth or granular, yellow-brown, the tubercle conic.—Frequent in marshes and along streams, often growing in shallow water; widely dispersed in both hemispheres. Called "junco" in Costa Rica, and "tul" or "tule" in Salvador. The pliable soft culms of this and similar species are much used in some parts of Central America for plaiting mats, which are used as mattresses on beds, and for other purposes.

Eleocharis retroflexa (Poir.) Urban. Rhizomes filiform or none; culms capillary, 2–20 cm. long, very weak and often lying upon the ground; spikelet 3–4 mm. long, containing 1–4 achenes, green or purplish; achene triquetrous, obovoid, white, coarsely cancellate, the tubercle pyramidal.—Frequent in marshes and along the borders of streams, often forming large matted carpets; occurring in the tropics of both hemispheres.

FIMBRISTYLIS Vahl

Annuals or perennials, the culms leafy near the base; spikelets usually in heads or umbels, terete, involucrate, the scales spirally imbricated, all fertile; perianth none; style 2–3-cleft, deciduous; achene lens-shaped or 3-angled.

Fimbristylis diphylla (Retz.) Vahl. Plants annual or perennial, glabrous, sometimes with short rhizomes, the culms slender, ordinarily 20–60 cm. high, the leaves shorter than the culms, 1.5–3 mm. wide; spikelets few or numerous, solitary in the umbels, brown or chestnut, obtuse, 5–10 mm. long; achenes biconvex, white or straw-colored, 5–11-costate on each surface.—Frequent in wet fields; generally distributed in tropical America; one of the common weedy plants of Central America. Perhaps not distinct from *F. annua* (All.) R. & S., of the Old World. Depauperate plants sometimes have a single spikelet at the top of the culm.

Fimbristylis miliacea (L.) Vahl. Plants annual, glabrous, very slender, commonly 20–30 cm. high; leaves usually shorter than the culms, 1–2 mm. wide; spikelets numerous, pediceled, subglobose, very obtuse, brown, 2–4 mm. long; achene transversely lineate, straw-colored or pale brown.—In sand along stream beds, sometimes forming dense tufts; generally dispersed in tropical regions.

Fimbristylis spadicea (L.) Vahl. Plants perennial, glabrous, coarse and stout; leaves erect, narrow and stiff, their bases thick and hard, chestnut-colored; spikelets few or numerous, 1–1.5 cm. long,

the scales obtuse, chestnut-colored; achene orbicular, somewhat reticulated, dark brown.—Growing in marshes or on sandy flats near the beach, sometimes forming dense clumps; common in such situations; extending to South America.

Fimbristylis spathacea Roth. Plants glabrous or nearly so, with short thick rhizomes, often forming dense clumps, the culms stout, 10–40 cm. high; leaves narrow, stiff; spikelets numerous, crowded in a dense, almost headlike inflorescence, 3–6 mm. long, obtuse, brownish; achenes obovoid, minute, nearly black, granulate. —Frequent on wet sand flats along the beach, forming large dense patches; occurring in the tropics of both hemispheres.

FUIRENA Rottb.

Fuirena umbellata Rottb. A coarse perennial with creeping rhizomes, often 1.5 meters high, more or less pubescent; leaves 8–15 mm. wide, with several conspicuous nerves, rough; spikelets numerous, in dense, terminal and axillary clusters, terete, the scales spirally imbricated, awned, pubescent, 1 cm. long; achene pale brown, 3-angled.—Frequent in marshes; native of the tropical regions of both hemispheres.

HEMICARPHA Nees & Arn.

Hemicarpha micrantha (Vahl) Pax. Plants annual, delicate, often only 1–3 cm. high; leaves setaceous, mostly shorter than the culms; spikelets ovoid, 2 mm. long, many-flowered, terete, in clusters of 2–4, brown, the scales spirally imbricate; achene obovate, slightly compressed, pale brown.—Growing in moist sandy thickets near the beach; widely distributed in tropical America, and in western Africa.

KYLLINGA Rottb.

Annuals or perennials, glabrous or nearly so, leafy near the base, or the leaves often reduced to sheaths; spikelets congested in a few dense heads, these usually subtended by an involucre of leaflike bracts; spikelets compressed, of 3–4 scales, only the middle one fertile, the scales 2-ranked and keeled; style bifid, the achene lenticular.

Kyllinga brevifolia Rottb. A slender perennial with long slender rhizomes; leaves long-attenuate, nearly equaling the culms, 2–4 mm. wide; heads 7–12 mm. long, green, the scales usually scabrous along the keel.—Frequent in wet fields; growing in the warmer regions of both hemispheres.

Kyllinga peruviana Lam. Plants perennial, with thick scaly rhizomes; leaves all reduced to loose sheaths; culms stout, 20–50 cm. high; bracts usually shorter than the head; head one, globose, 1 cm. in diameter.—In wet sand flats along the beach, frequently forming large and dense colonies; widely distributed in tropical America.

Kyllinga pumila Michx. A slender tufted annual, 5–40 cm. high; leaves 2–3 mm. wide; heads 1–3, ovoid or cylindric, 5–10 mm. long.—Frequent in open fields, sometimes in boggy places, occasionally a weed in cultivated ground; generally distributed in the warmer parts of the Americas, and in Africa.

Kyllinga pungens Link. A perennial with thick rootstocks; lower leaves reduced to loose sheaths, the upper ones with short blades 4 mm. wide; bracts 1–6 cm. long; head one, globose, 6–9 mm. thick.—Common in marshes near the beach; widely dispersed in the tropics.

REMIREA Aubl.

Remirea maritima Aubl. A glabrous perennial with long slender rhizomes; culms 5–25 cm. high, densely leafy, the leaves erect or spreading, 8 cm. long or less, stiff, with very sharp tips; spikelets 1-flowered, arranged in a dense sessile ovoid head 1–2 cm. long, straw-colored or dark brown; achene smooth.—Common in sand along the beach; a characteristic strand plant of the tropics of both hemispheres.

SCIRPUS L.

Scirpus cubensis Kunth. A stout glabrous perennial with long stolons, the culms often decumbent and weak; leaves basal, 5–9 mm. wide; inflorescence of a few umbellate heads, the umbels simple, with long leaflike bracts, the heads globose, 1–1.5 cm. thick, composed of very numerous spikelets, these 4–8 mm. long; achene narrowly obovoid, pale.—Growing in shallow open water near Tela; widely dispersed in tropical America, also in Africa. In Central America found only along the Atlantic coast.

SCLERIA Berg

Annuals or perennials with leafy culms; spikelets small, clustered, spicate, or paniculate; flowers monoecious, the staminate and pistillate in the same or different clusters; pistillate spikelets 1-flowered; perianth none; style 3-cleft; achene globose or ovoid, hard and bonelike, usually subtended at the base by a disk.

Scleria melaleuca Schlecht. & Cham. *Navajuela.* Plants coarse, perennial, 30–80 cm. high, with rhizomes, glabrous or nearly so; leaves 1 cm. wide or less, conspicuously nerved, with very rough margins; panicles small, axillary; achenes smooth, subglobose, 1.5–2 mm. long, dark purple or blackish, shining.—Common in wet thickets, open swamps, or cultivated ground; one of the common weedy sedges of Central America and Mexico.

Scleria microcarpa Nees. Plants stout or slender, about a meter high, with horizontal rhizomes; leaves 8–11 mm. wide, the sheaths narrowly 3-winged; panicles narrow and spikelike; achenes 1–2 mm. long, smooth, white; margin of the disk ciliate.—In marshes near Tela; ranging from Guatemala to the West Indies and South America. In this, as in most of the other species, the very rough margins of the leaves cut the flesh painfully and deeply if the plants are handled carelessly.

Scleria paludosa Kunth. A coarse and stout perennial, 1–2 meters high; leaves 1.5–5 cm. wide, the sheaths 3-winged; panicles large and much branched; achenes ovoid, white or yellowish, smooth, 5–6 mm. long, the margin of the disk ciliate.—Occasional in ditches and marshes; extending from Guatemala to Peru, and in Cuba.

PALMACEAE. Palm Family

Palms are abundant in the Lancetilla region as to both species and individuals, and there are represented here most of the groups which grow in Central America. The number of species is, of course, not so great as might be found in an area of similar size farther southward. Besides the native species, various exotic palms have been planted at Lancetilla.

ACROCOMIA Mart.

Acrocomia mexicana Karw. *Coyol. Wine palm.* A large palm with tall thick trunk densely armed with long slender dark spines; leaves very large, pinnate, with narrow segments, densely clustered at the top of the trunk, the old leaves persisting below the living ones; segments of the leaves as well as the midrib densely spiny; flower and fruit panicles very large and heavy, pendent, spiny; perianth of the pistillate flowers united only at the base; fruit large, black, globose, smooth.—I saw this plant in cultivation at Tela, and it is plentiful beyond the Ulua River about La Lima and elsewhere; probably it grows also near Progreso, although I did not see it there.

It ranges northward into Mexico, and forms probably representing the same species extend to Panama. Sometimes called "palma de vino" in Panama.

This is one of the common palms of Central America, at least on the Pacific slope, where it sometimes forms extensive forests. The fruits are eaten by cattle, and they are reported also to have served as human food. The sweet sap obtained from the trunk has an agreeable flavor, and by slight fermentation there is obtained a palm wine which is much appreciated in the regions where the tree is native.

ASTROCARYUM Mey.

Astrocaryum cohune (Wats.) Standl. *Lancetilla.* A rather small palm, the trunk slender, 1.5–4.5 meters high, densely armed with irregularly spaced spines, these often 5 cm. long or more, linear or broader, compressed and 2-edged, blackish; leaves large, irregularly pinnate, with narrow divisions, the petiole and rachis armed with spines; spathes 20–30 cm. long, white-woolly, covered with slender needlelike spines; staminate and pistillate flowers on the same branched spadix, but the staminate branches soon wither and fall; fruits in a dense spike, numerous, 5 cm. long, obovoid, covered with short slender spines.—Very common in the forests on the lower hills; occurring also in Guatemala. In the latter country the same name, given in reference to the lancelike spines, is applied to the plant, and Watson reports also the name "warree cohune," probably of Indian derivation. He states that the fruits (seeds?) are edible, but they are not eaten on the Honduran coast.

This is one of the abundant and characteristic palms of the Tela region, and it is from this plant that the Lancetilla Valley derives its name. The palm is of no economic importance locally, but it is a great pest in tramping through the forest, where one must ever be on guard to escape the sharp spines, which penetrate the flesh easily and painfully.

ATTALEA HBK.

Attalea cohune Mart. *Corozo. Manaca* or *Cohune palm.* A tall palm with very thick trunk covered with the persisting leaf bases, unarmed; leaves gigantic, sometimes reaching a length of 10 meters or more, plumelike, pinnate, with numerous long narrow segments, erect and recurved; flower and fruit panicles very large and heavy, drooping, 1 meter long or more, containing very numerous fruits, often 500–800 or an even greater number; fruits ellipsoid, resembling

a small coconut, about 6 cm. long, beaked, containing usually a single seed.—Abundant everywhere at lower elevations, growing in swamps or on hillsides, in the swamps often projecting above the other trees; ranging to Mexico and probably farther southward in Central America. In Panama another presumably distinct species occurs, and it is not known just where in Central America the two species meet.

This is by far the finest and most imposing of all Central American palms, its huge leaves greatly exceeding those of every other species. Notwithstanding their size, they are very graceful, and the corozo palm is a tree of great beauty. In the Tela region it grows in the greatest abundance nearly everywhere, and is especially conspicuous in the pastures, where it is left partly for its shade and partly because it is hard to cut the trees down. On the hills about Lancetilla the corozo makes a dense undergrowth in the forest up to a definite elevation, probably about 200 meters, where it disappears altogether. Where corozos grow, little other undergrowth is to be found, because of their dense shade. Reproduction is rapid, and the ground often is covered with the seedlings.

This palm is of much economic importance. It is the material utilized in most of the native huts. The heavy midribs often are used for the framework, and almost always the leaves, laid crosswise, form the roof thatching. The seeds are rich in oil, and they have been utilized to some extent, but they are so hard that the extraction of the oil is difficult, and it has been impossible to devise satisfactory machinery for crushing them. During the European war the seeds were used for making charcoal for gas masks. Palm wine is made from the trunks in some regions, including Honduras, and hats from the young and tender leaves.

BACTRIS Jacq.

These are small erect palms with usually slender stems, viciously armed throughout with long slender needlelike spines. The leaves are clustered at the top of the stem or scattered along its upper part; they are pinnate, with numerous narrow, often spiny segments. The spadix is usually small and branched, and subtended by two hard spiny spathes. The globular fruits are small and smooth, each containing a single seed. Numerous species have been reported from Central America, but, as is the case in all the other genera, they are poorly understood, and no one knows how many of them represent recognizable forms. As a matter of fact, very little attention has

been paid to the palms of Central America since the days of Oersted, nearly a hundred years ago. Those who have accumulated information concerning them have failed to place their knowledge upon record, consequently their data are wasted. The account of the Lancetilla palms here given is far from satisfactory, but there is no reason for believing that at the present time any one could give a more satisfactory account of them, or of the palms of any other part of Central America.

Bactris hondurensis Standl. *Biscoyol.* Stems very slender, about 1 meter high, solitary, copiously armed with very slender, blackish, needlelike spines; leaves small, on slender spiny petioles, simple, or with only a few narrow pinnae below, deeply parted at the apex, the segments long-acuminate; fruiting spadices small and short, the few fruits globular, bright red, 1–1.5 cm. in diameter, smooth.—In wet forest high on the hills above Lancetilla; known only from this region.

Bactris major Jacq. *Biscoyol.* Stems slender, usually 1–3 meters high, forming large dense clumps or colonies, densely armed with very long and slender spines; leaves short, parted into numerous linear segments, these armed along their edges with short spines, the rachis and petiole covered with very long, slender, blackish, woolly spines; fruits blackish or purplish at maturity, ellipsoid, nearly smooth, surrounded at the base by a toothed cup; spadix branched; spathe covered with slender blackish needlelike spines.—Common in coastal swamps, where it often forms extensive and impenetrable thickets; extending to South America. Called "lata" and "palma brava" in Panama. The Honduran name is a variant of the Aztec "huiscoyol," signifying "spiny palm." The scant acidulous pulp of the fruits is sometimes eaten, likewise the kernels of the seeds, but they are not very palatable, and this palm has little excuse for existence. In the swamps it is a terrible pest, and one must be careful to avoid its formidable spines, which inflict painful wounds. Horses often seem to go out of their way to brush their riders against the plants, which one would suppose would harm the animals quite as much as their riders.

Bactris sp. A slender low palm, the stems 1.5–3 meters high, forming small clumps, armed with very slender blackish spines; leaves long, divided into numerous linear pinnae, these unarmed and the rachis armed with but few spines.—Frequent in the forest on the hills above Lancetilla. Although so common there, the plant was not

found in either flower or fruit, and it is impossible to guess at its specific determination.

CHAMAEDOREA Willd.

The Chamaedoreas include some of the smallest palms known, certain of the Central American species sometimes flowering when only 30 cm. high. They have slender green unarmed stems. The leaves are usually pinnate but often simple, and scattered along the upper part of the stem. The small inflorescences are mostly branched but sometimes simple, and before anthesis they are enclosed in several green husklike spathes. The two sexes of flowers are borne on separate plants. As the fruit ripens the branches of the spadix usually are colored orange, and the small, globular or oblong fruits are generally black, and contain a single seed.

These palms are favorites in cultivation because of their reduced size. When growing in the forest they are very graceful and handsome, the most attractive, in many respects, of all the Central American palms. The leaves are usually colored a vivid green, and the contrast between them and the brilliantly colored fruiting spadices is often very pleasing. The Chamaedoreas grow only in deep forest, where they sometimes form a considerable proportion of the ground cover. They die as soon as the protecting trees are removed.

The unopened inflorescences with their enveloping spathes resemble closely a small ear of corn with its husks. When opened there is found inside the curled and twisted mass of the branches with their flowers, suggesting a mass of whitish worms. These young and tender inflorescences are a favorite vegetable throughout Central America. When properly prepared for the table, usually by dipping in egg and frying, they are delicious, having a slightly bitter but altogether agreeable flavor. The Chamaedoreas growing about Lancetilla have such small inflorescences that they are almost useless for this purpose. In some species the flowers are so bitter that they are never eaten.

This is the largest group of Central American palms, and many species have been described. As in other groups, the species are much confused, and little dependence can be placed upon the specific names here used.

Chamaedorea Arenbergiana Wendl.? *Pacaya.* Stems stout, 1.5–2.5 meters high; leaves parted into numerous narrow long-acuminate segments; fruiting peduncle very thick and stout, orange-

red, bearing one or sometimes two very thick spikes; fruits black, 1.5 cm. in diameter, globose.—In wet forest on the hills above Lancetilla.

Chamaedorea geonomaeformis Wendl. *Pacaya.* Stems very slender, 0.5–1.5 meters high, smooth, green, leafy; leaves simple, small, usually about 30 cm. long, slender-petioled, bifid at the apex, the two lobes acute or acuminate; fruiting spadix simple, long and slender, the rachis orange or bright red; fruit globose, scarcely 1 cm. in diameter, black.—Common in forests on the hills above Lancetilla; also in Guatemala and British Honduras.

Chamaedorea graminifolia Wendl. *Pacaya.* Stems slender, green, smooth, reedlike, 1.5–4.5 meters high; leaves large, divided into numerous long linear segments; inflorescences pendent, with many long slender drooping flexuous branches, the flowers green; rachis in fruit orange; fruits oblong.—Common in the hillside forests; widely distributed in Central America.

Chamaedorea pacaya Oerst. *Pacaya. Plate VII.* Stems slender, smooth, green, 1.5–3 meters high; leaves small, pinnate, the few segments broad and sometimes slightly curved, long-tapering; inflorescence with only a few short branches; fruiting spadix with only 5–8 or sometimes more numerous short slender orange branches; fruits globular, black, 1 cm. in diameter.—Common in wet forest; ranging to Costa Rica.

COCOS L.

Cocos nucifera L. *Coco. Coconut.* This best-known of all palms is abundant in the Tela region, growing not only along the coast but far inland. Formerly it was planted extensively about Tela for market, but the nuts are not exported at the present time. Although presumably introduced in Honduras, the plant grows abundantly everywhere along the coast, and seems to be perfectly at home. There is probably no clear-cut evidence to prove that the coconut existed in Central America before the Spanish colonization, but since that time it has become widely dispersed. In Central America it is esteemed chiefly for the young fruits, whose sap, strangely enough called "milk," makes a most satisfying beverage on a hot day. The meat is used to some extent for preparing sweetmeats. The trees are picturesque shade trees, and for that reason they are much planted in parks.

DESMONCUS Mart.

Desmoncus polyacanthos Mart. *Balaire. Plate VIII.* A large woody vine, the slender stems armed with slender needlelike

blackish spines, the spathes also spiny; leaves large, pinnate, the segments spiny near the base; upper part of the leaf rachis without leaflets but bearing pairs of very stout, abruptly reflexed spines; fruits oblong, 1.5 cm. long, arranged in large panicles.—Occasional in forests; ranging to South America. Called "matamba" in Panama. The plant is one of the greatest nuisances in the forest, for the leaves reach far out as if groping to catch any passing object. Unless one is careful when passing the plants, serious lacerations may be caused by the spines of the leaves, which are very strong.

GEONOMA Willd.

The Geonomas are small or scarcely medium-sized, unarmed palms having comparatively small, pinnate or often simple leaves. The inflorescences are simple or branched, the small flowers being sunken in pits in the branches. The fruits are small, globose, and 1-seeded.

Geonoma binervia Oerst. *Pacuca. Plate IX.* Stems stout, smooth, 1–4.5 meters high, pale; leaves large, pinnate, with numerous narrow segments, the upper ones confluent; spadices pubescent, twice branched, with very numerous short and rather stout but flexible branches; peduncle dull red, the inflorescence pale reddish; fruits scarcely 1 cm. long.—Common in the hillside forests; extending to Costa Rica. Called "caño de danto" in Nicaragua. This palm is an exceptionally handsome one because of the neat clean trunks and large leaves. The young inflorescences are sometimes cooked and eaten in Honduras.

Geonoma glauca Oerst.? *Pacuquilla. Plate X.* The trunk 1 meter high or less, often none, the leaves then arising from the ground; leaves stalked, stiff, divided below into long linear segments, the upper segments broader and confluent; spadix unbranched, long and slender, the rachis dull red; fruit purple, 1 cm. long.—Frequent in mountain forests; also in Nicaragua. The leaves are used locally for thatching huts. This species has been referred to the genus *Calyptrogyne*, which is sometimes kept distinct from *Geonoma*.

Geonoma trifurcata Oerst. *Pacuquilla.* Stems thick, 1 meter high or less; leaves few, long-stalked, simple, bifurcate at the apex, the segments long-tapering, rusty-scurfy beneath; peduncles long, bearing at the apex usually three or four clustered spikes 8–17 cm. long; flowers white or pale green.—Frequent in wet mountain forest; also in Nicaragua, where it is called "suita." The leaves are used in both Honduras and Nicaragua for thatching.

GUILIELMA Mart.

Guilielma utilis Oerst. *Pejibaye.* A large palm with tall slender trunk, this bearing alternating light and dark bands of long slender spines; leaves large, pinnate, very spiny, the segments narrow, not 2-ranked; fruits large, red or yellow at maturity.—Not native in this region, but an avenue of the trees has been planted in front of the office at Lancetilla, and the trees will doubtless be planted elsewhere when young plants are available. Common in Costa Rica and Panama. This is one of the most valued palms of Central America. The large fruits are borne in huge bunches, and ripen in midwinter. They are much prized for food, especially in Costa Rica, where the trees are very plentiful. When boiled the flesh of the fruit is yellow, soft, sweet, and very good to eat, somewhat suggesting sweet potato in flavor and consistency. The very hard wood is utilized in some regions for making bows, arrows, clubs, and other articles.

IRIARTEA Ruiz & Pav.

Iriartea durissima Oerst.? *Palmiche.* A large unarmed palm; trunk very tall, slender, smooth, pale, supported at the base by numerous prop roots, these slender and interlaced.—On the tops of the hills above Lancetilla, not growing at lower elevations. The determination of the palmiche is a pure guess, for it was impossible to obtain complete material. The trees bore no flowers or fruits when I saw them.

MALORTIEA Wendl.

Malortiea gracilis Wendl. Stems very slender, 1–2.5 meters high, green; leaves long-stalked, mostly 30–40 cm. long, with only a few broad segments, these having numerous elongated perforations or "windows" along the midrib, irregularly toothed at the apex; inflorescence long-stalked, with numerous slender branches; fruits oblong, 1 cm. long.—Common in mountain forests; extending to Guatemala and Costa Rica. This is one of the handsomest and most curious palms of Central America, easy to recognize by the perforations of its leaves. A Costa Rican species of *Malortiea* is the smallest palm that I have ever seen in Central America. It has simple oblong leaves, and blooms when only 30 cm. high.

OREODOXA Willd.

Oreodoxa oleracea Mart. *Yagua. Royal palm.* A very tall palm, the trunk smooth, pale, slightly swollen, unarmed; leaves

clustered at the top of the trunk, long, horizontal, pinnately divided into numerous narrow segments; inflorescences inserted below the leaves, large, pendent, twice branched; fruit purplish, obovoid-oblong, 1 cm. long.—Frequent in swamps near the coast; also in the West Indies, and probably in other parts of Central America. The determination of this Honduran palm is very uncertain, since specimens could not be obtained. It has been referred by other writers to this species, but the determination is open to question. The trees are very handsome, often rising high above the surrounding forest trees. None were noticed in the immediate vicinity of Tela, but some grow at Puerto Arturo, and many others in the swampy land near the Ulua.

CYCLANTHACEAE. Cyclanthus Family

The plants of this family somewhat resemble palms in general appearance, and, if noticed at all by non-botanists, are likely to be mistaken for palms. They are stemless or have long climbing stems. The leaves are variously divided or lobed, the divisions being conspicuously nerved like those of palm leaves. The flowers are arranged in dense spikes.

CARLUDOVICA R. & P.

This genus is represented in Central America by a rather large number of species, which are poorly understood. The names of two of the species listed here are very uncertain. The plants have 2–4-lobed leaves. The flowers are not arranged in rings on the spike as they are in *Cyclanthus*.

Carludovica Oerstedii Hemsl. *Plate XI.* Plants stemless, the leaves all basal, less than a meter long, long-stalked, 2-cleft, the divisions narrow, long-tapering; fruiting spikes 2–4.5 cm. long, green; leaves pale green.—Common in some localities along streams in deep forest, especially in rocky places; extending to Panama. Called "tucusò" in Costa Rica.

Carludovica palmata R. & P. *Junco. Panama hat palm.* Plants stemless; leaves 4-parted, the segments many-cleft, large and broad, the slender petioles 1–3 meters high; the spikes, when in flower, are covered with very long, entangled, whitish filaments.—Common in wet forest; ranging to Guatemala and southward to Peru. Called "jipijapa," "Portorrico," "palmita," "atadero," and "guachibán" in Panama; "chidra" in Costa Rica; and "palmilla" in Guatemala. The plant is easily recognized by its leaves, whose blades have

some resemblance to a Maltese cross. It is from the fiber of the young leaves of this plant that the "Panama" hats are made, most of them in Ecuador. Hats are made from the leaves also in Honduras, and in other parts of Central America.

Carludovica utilis (Oerst.) B. & H. A large epiphytic vine with long coarse tough stems; leaves petioled, deeply 2-lobed, the segments broad, acuminate.—Frequent on large trees in wet forest; ranging from Guatemala to Panama. The stems are used in some parts of Central America for making furniture similar to that made from willow branches.

CYCLANTHUS Poit.

Cyclanthus bipartitus Poit. Plants large, stemless; leaves long-stalked, 2-parted, the segments broad, 30–60 cm. long and larger, long-pointed, glabrous; flower spikes arising on naked scapes from the base of the plant, the flowers arranged in alternating rings of sterile and fertile flowers, the mature spike strongly suggestive of a screw.—Common in wet forest; ranging from Guatemala to Peru. Called "Portorrico" in Panama and "hoja de lapa" in Costa Rica. The plant often grows in association with the Panama hat palm.

ARACEAE. Arum Family

The plants of this family form a large and conspicuous part of the epiphytic vegetation of Central America, although not all of them are epiphytes. They are coarse glabrous herbs having petioled leaves which are either entire or variously lobed or parted. The simple peduncles bear a simple spike of perfect or unisexual flowers, which is surrounded by a green or colored spathe, the whole being mistaken by the uninitiated for a single flower. Typical plants of the family are the common calla (*Zantedeschia*) and Jack-in-the-pulpit (*Arisaema triphyllum*). The fruits are small and often red berries.

The watery sap of these plants, or at least of most of them, contains needlelike crystals, which penetrate the tongue when a piece of the leaf or root is chewed, causing pain and often much swelling. The plants are noteworthy for the various forms which their leaves assume at different stages of growth. The young plants often are altogether unlike the adult ones, the leaves of the former frequently being simple and entire, while the mature leaves are lobed or parted. Little is known regarding the juvenile forms, but they would furnish an interesting field for study and investigation. It is a waste of time

in making herbarium specimens to gather the juvenile forms, unless they can be associated definitely with adult plants.

ANTHURIUM Schott

This is the largest genus of the family, and it is well represented in Central America. The plants are mostly stemless and epiphytic, but in some species long climbing stems are developed. The leaves are either entire or parted. The flowers are all perfect, and they have a perianth, this being wanting in most of the groups listed here. The ovary is 1–2-celled.

Anthurium aemulum Schott. A rather small epiphytic vine; leaves parted into 7–11 digitately arranged, narrow, long-acuminate, entire segments.—Frequent in wet forest; distributed from Mexico to Panama.

Anthurium concinnatum Schott. Plants large, terrestrial, stemless or nearly so; leaves long-petioled, very large, ovate-cordate; spathe white or greenish white; spadix lavender when young, becoming orange.—Frequent in wet forest, often growing on wet mossy rocks; ranging from Guatemala to Costa Rica.

Anthurium consobrinum Schott. Plants large, epiphytic, stemless; leaves long-petioled, lance-oblong, 30–40 cm. long or larger, 8–12 cm. wide, narrowed to the base, abruptly acuminate at the apex, conspicuously 3-nerved; inflorescence green; berries bright red.—Frequent on trees in wet forest; also in Nicaragua and Costa Rica.

Anthurium crassinervium (Jacq.) Schott. A large coarse stemless epiphyte; leaves numerous, erect, large, obovate, often more than 60 cm. long, very thick; fruiting spikes very large and heavy, recurved and pendent, the large berries orange-red.—Occasional on tall trees; ranging to South America.

Anthurium myosuroides (HBK.) Endl. An epiphytic vine with long slender stems; leaves slender-petioled, oblong to ovate, shallowly cordate at the base, thin, acute or acuminate; spathe and spike green.—Frequent in wet forest, creeping on tree trunks; ranging to Colombia.

Anthurium scandens (Aubl.) Engl. A small plant with elongated stout stems, growing on tree trunks or branches; leaves short-petioled, mostly 10–15 cm. long, thick and fleshy, acute at each end; spadix short and thick; berries white or lavender.—On trees in wet

forest; widely distributed in tropical America. One of the common species of Central America.

Anthurium scolopendrinum (Ham.) Kunth. *Plate XII.* An epiphyte, stemless or nearly so; leaves comparatively thin, oblanceolate, 10–25 cm. long, long-tapering to the base, acute or acuminate, 3-nerved; spadix short and rather slender.—Frequent on trees in wet forest; extending to South America.

CALADIUM Vent.

Caladium bicolor (Ait.) Vent. *Corazón sangriento.* A stemless terrestrial plant, easily recognized by its peltate leaves, which are spotted or variegated with red, white, or yellow.—Probably native of Brazil, but grown commonly for ornament in most parts of Central America. Often planted in cemeteries. Called "corazón de Jesús" in Panama and in the interior of Honduras, and "corazón sangriento" in Guatemala. This plant is the fancy-leaved caladium which is seen so often in the hothouses of the United States, where it is grown for its beautiful foliage.

COLOCASIA Schott

Colocasia esculenta (L.) Schott. A large stemless plant with ovate-cordate peltate leaves.—Grown here occasionally for its edible roots; native of India. Called "malanga" and "yautía" in the West Indies.

DIEFFENBACHIA Schott. Dumb-cane

Coarse terrestrial plants, usually with well-developed, erect or ascending stems, the stems often rooting along the lower part, and lying upon the ground; sap milky, with a strong skunklike odor; leaves entire, oblong to ovate, obtuse or rounded at the base, petioled; spathes produced in the axils of the leaves, closely enclosing the fruiting spikes; berries red when mature. The juice is reported to cause blisters and inflammation if it comes in contact with the skin, but I do not believe that it does so invariably, since I never have been affected by it, in spite of having made many specimens of the plants.

Some of the species of *Dieffenbachia* are grown for ornament in the hothouses of the United States, the preferred forms being those whose leaves are blotched with white. Such forms are found occasionally in the forests of Central America, and I noticed them about Lancetilla. The name "mother-in-law plant" is sometimes given to the cultivated Dieffenbachias, because of the fact that when a bit

of the leaf is chewed it more or less paralyzes the tongue and deadens sensation in it. The same effect may be obtained by chewing cautiously a piece of leaf of the common cultivated caladium or elephant-ear plant.

Dieffenbachia Oerstedii Schott. *Hoja de puerco.* Plants erect, about 60 cm. high, the leaves rather small and thin; spathe orange; berries scarlet.—Common in wet forest, especially in alluvial soil; ranging from Guatemala to Costa Rica. Called "otó de lagarto" in Panama.

Dieffenbachia seguina (L.) Schott. *Hoja de puerco.* Plants larger, often 1.5 meters high, erect, the leaves much larger, thick and succulent; spathe green.—Occasional in wet forest; extending to the West Indies and South America. Called "cuyanigua" in Salvador.

MONSTERA Adans.

Monstera pertusa (L.) de Vriese. *Hoja de sereno. Plate XIII.* A large epiphytic vine, climbing high on trees; leaves large, oval or elliptic, acute, rounded at the base, perforated with few or numerous large holes, sometimes pinnately lobed; fruiting spadix large and composed of numerous juicy berries.—Common in wet forest; widely distributed in tropical America. The plant is easily recognized by the peculiar form of its leaves, with their large perforations. The species of *Monstera* often are grown in northern hothouses for ornament or as curiosities. The fruiting spadices are sweet and edible, but care must be exercised to eat only those which are fully ripe, and even they often cause an unpleasant burning sensation in the mouth because of the crystals which they contain.

Monstera dilacerata Koch. *Campanilla.* A large coarse epiphytic vine; leaves similar in shape, but not perforated, deeply pinnate-lobed, the lobes broad.—Frequent in deep forest; ranging to northern South America. The species of *Monstera* are poorly defined, and most of them doubtfully distinct, but this one appears to be sufficiently different from *M. pertusa.*

MONTRICHARDIA Crüger

Montrichardia arborescens (L.) Schott. A coarse erect simple plant 1–2 meters high or sometimes even taller; leaves numerous along the stem, long-petioled, arrow-shaped, the long basal lobes acute; spathes large, greenish yellow or whitish, enclosing the spadix.

—Frequent along streams and in swamps near the coast, usually growing in water; extending to South America. The plant may be recognized easily by its habit and by the acute basal lobes.

PHILODENDRON Schott

All the species listed here are large epiphytic vines with numerous scattered petioled leaves which are either entire or lobed or parted. The flowers are of two sexes on the same spadix, the staminate ones above, the fertile below. The spadix usually is wrapped closely in the persistent spathe, which most commonly is green. Many species of the genus occur in Central America, where they form a conspicuous part of the epiphytic vegetation in both the lowlands and the mountains.

Philodendron guttiferum Kunth. *Plate XIV.* A large and rather slender vine, often forming dense masses on trees; petioles broadly winged, extending nearly to the base of the blade; blades oval or elliptic, rather small, obtuse or rounded at the base, entire; inflorescences nearly sessile, the spathe green.—Common in wet forest; ranging from Guatemala to South America.

Philodendron Hoffmannii Schott. *Hoja de sereno.* A large coarse vine; leaves large and rather thick, broadly ovate, acute or obtuse at the apex, shallowly or deeply cordate at the base, entire.—In wet mountain forest; ranging from Guatemala to Panama.

Philodendron radiatum Schott. *Bejuco de campanilla. Plate XV.* A large and very coarse vine; leaves large, broad, deeply pinnate-lobed, the numerous lobes narrow, thick and fleshy; spathe green.—Common on trees in wet forest; generally distributed in Central America, and occurring also in Mexico. Called "hoja de peche" in Salvador, and in Panama "azota cabeza" and "chaldé." The plant is very conspicuous because of the form of its large leaves, which often are very lustrous.

Philodendron Smithii Engl. *Hoja de sereno.* A large coarse vine; leaves thick and fleshy, large, deeply cordate, somewhat narrow above the base, the basal lobes large and rounded; spathe green.—In wet forest; also along the coast of Guatemala.

Philodendron tripartitum (Jacq.) Schott. A large epiphytic vine, often forming dense festoons on trees; leaves rather thin, bright green, long-stalked, 3-parted, the segments entire, oblong to elliptic, acute or acuminate.—Common in forest; widely distributed in tropical America.

PISTIA L.

Pistia Stratiotes L. *Water lettuce.* A plant quite distinct in appearance from other members of the family; leaves obovate, thick and spongy, soft, forming a dense rosette which floats on the surface of water; flowers minute and seldom noticed.—Common in pools or quiet streams; widely dispersed in tropical regions. Known in Salvador by the names "lechuga de agua," "repollo de agua," "lechuga de sapo," and "verdolaga de agua." The plants often form large and dense colonies over the surface of quiet water, in association with other aquatic plants.

RHODOSPATHA Poepp.

Rhodospatha Tuerckheimii Engl. A large epiphytic vine; leaves slender-stalked, elliptic, large, acute or acuminate, obtuse or rounded at the base, entire, thin, the petioles margined nearly to the top; inflorescence long-stalked, the peduncle enclosed in the leaf sheaths; flowers perfect, in a long cylindrical spike, the spike conspicuously stalked, pale purplish.—Frequent on trees in wet forest; occurring also in Guatemala.

SPATHIPHYLLUM Schott

Spathiphyllum Friedrichsthalii Schott. Plants terrestrial, stemless, the leaves long-petioled; blades thin, large, elliptic, acuminate, acute or obtuse at the base; inflorescence long-stalked, erect, the spathe large, elliptic, usually 20 cm. long or more, pale green or greenish yellow, open and flat; spadix long and stout, the fruiting spikes green or yellowish, appearing tubercled by the projecting styles.—Frequent in wet forests and thickets; extending from Guatemala to Colombia. A related species is called "huisnay" in Salvador. In that country the young and tender inflorescences are cooked with eggs and eaten.

SYNGONIUM Schott

Large or small epiphytic vines with large scattered leaves; leaf blades parted into 3 or more segments; peduncles short, the green or colored spathe wrapped about the spadix and persisting; flowers of separate sexes.

Syngonium podophyllum Schott. A large vine, often forming dense festoons over trees; leaves 3-parted, the divisions narrow, acute or acuminate, the two lateral segments stalked and usually 2-parted;

spathes green, or at maturity bright red; spadix at first cream-colored. —Common in wet forest; ranging from southern Mexico to Panama. Called "azota cabeza" in Panama, "piñuela" in Guatemala, and "pico de guara" in Salvador.

Syngonium Rothschuhianum Engl. A small vine; leaves larger, 3-parted, the divisions all broad and entire, sessile, dark green; spathe green.—Growing on a mossy rock in wet forest, and evidently an essentially epiphytic plant; occurring also in Nicaragua.

XANTHOSOMA Schott

The Xanthosomas are terrestrial plants, often with thickened tuberlike roots, commonly stemless, but occasionally with well-developed superficial rootstocks. The fruiting spadices are enclosed in the large persisting spathes. The flowers are of two sexes, the pistillate on the lower part of the spadix, the staminate above.

Xanthosoma roseum Schott. *Quiscamote. Plate XVI.* Plants usually very large, 2 meters high or more, sometimes with thick stems which recline on the surface of the ground; leaves huge, often more than a meter broad, ovate-cordate, pale beneath, thin; spathe 20 cm. long, green or whitish, often pinkish within.—Common on open stream banks, growing sometimes in shallow water; ranging from Costa Rica to southern Mexico. This showy plant is common in many places near Lancetilla and throughout the whole Tela region, always very conspicuous because of its great size. The leaves make a very good protection against the sudden showers so prevalent here, for they may be thrown over the shoulders, like a cape, and they are large enough to protect a tall man.

Xanthosoma violaceum Schott. *Malanga.* Plants stemless, with a thickened tuberlike caudex; leaves large, ovate-sagittate, slightly tinged with purple; spathe with a broad limb which is cream-colored and tinged with purple.—Cultivated for its roots, which are cooked and eaten; widely distributed in tropical America, at least in cultivation. Called "otó" in Panama, and by the Jamaicans living there "badú" and "coco." Known in Salvador as "quequeshque." The young leaves are cooked and eaten by the Caribs of Honduras.

LEMNACEAE. Duckweed Family

The plants of this family are the smallest flowering plants known, some of them being less than a millimeter in length, and of very simple structure. The plant consists of a small body or thallus which is

disklike, and floats upon the surface of the water. The minute flowers, seen only under a microscope, are borne on the upper surface of the thallus, and consist of a single stamen, or of a single pistil.

LEMNA L. Duckweed

Lemna cyclostasa (Ell.) Chev. Thallus oval, more or less asymmetrical, scarcely 2 mm. long, bearing a single root on its lower surface.—Occasional in quiet pools, forming dense masses over the surface of the water; widely dispersed in tropical America.

SPIRODELA Schleid.

Spirodela polyrhiza (L.) Schleid. Fronds solitary or united in colonies, rounded-obovate, 2.5–4.5 mm. long, bearing several rootlets on the lower surface.—Floating in quiet pools; widely distributed in both hemispheres.

BROMELIACEAE. Pineapple Family

The plants of this family form a large group which is wholly confined to the western hemisphere, being probably the largest family of plants confined to one or the other of the two halves of the earth. They are mostly epiphytes, with normally large basal clusters or rosettes of narrow leaves, which often are covered with small grayish scales. The flowers are regular or nearly so, mostly in spikes, and have 3 sepals, 3 petals, and 6 stamens. The fruit is a berry or capsule, in the latter case often filled with seeds having hairlike appendages, by which they are widely dispersed. The plants often are confused with orchids by those who are not botanists, and many of them are quite as handsome and showy as the majority of the orchids. Very frequently the petals are bright blue or violet.

The inflated leaf bases of many species hold water, in which mosquitoes and other insects find congenial breeding places. Frequently the plants form very heavy loads on tree branches in wet forest, sometimes causing the branches to break with their excessive weight. The seeds germinate wherever they find a lodging place. Young plants of the Tillandsias frequently are found on roofs, fence posts, or even on telegraph wires, in the last case suggesting, when seen from a distance, a row of small birds perched on the wires.

AECHMEA R. & P.

The Aechmeas are mostly rather large plants, rather variable in appearance, with narrow or broad leaves having very prickly margins.

The bracts of the inflorescence often are brightly colored and showy. The ovary is inferior.

Aechmea bracteata (Sw.) Mez. *Plate XVII.* Leaves long and narrow, rather soft and flexible, bright green, the margins remotely prickly; flowers in clustered bracted spikes arranged along a short axis; bracts bright red, the lowest ones large and somewhat leaflike.—Frequent in wet forest, growing on trees or on wet mossy rocks; ranging to Mexico and Nicaragua.

Aechmea Mariae-reginae Wendl. *Gallinazgo.* A tall coarse plant with very long, stiff, long-pointed leaves 7 cm. wide or more, the leaves very numerous, ascending, their margins densely prickly; inflorescence very long, cylindrical, and spikelike; bracts at the base of the inflorescence large, rose-pink.—On trees in wet forest; ranging southward to Costa Rica, where the plant is called "flor de Santa María" and "corpus." The determination of the Honduras material is uncertain. The Costa Rican plant is one of the most beautiful ornaments of the Central American forests, because of its gorgeously colored bracts.

ANANAS Adans.

As represented in Central America, this genus consists of two species of rather different appearance.

Ananas magdalenae (André) Standl. *Pita.* A large coarse terrestrial plant with numerous long narrow basal leaves, these thin and flexible, their margins armed with rather remote, large, recurved prickles; inflorescence large and headlike, stalked, 10–15 cm. in diameter, bright red; fruits juicy, not united as in the pineapple.—Infrequent here, but sometimes forming dense thickets in deep forest at middle elevations on the hills; ranging from British Honduras to Ecuador. Called also "piñuela" in Panama, and "pita floja" in Salvador. The West Indians living in Panama call the plant "pingwing," and it is known rather widely under the name "silk-grass." The very acid fruits are eaten occasionally, either raw or cooked. I did not find the plants with either flowers or fruits in Honduras, perhaps because of the season. The leaves of this plant furnish one of the best fibers known, notable for its fineness, strength, and length. It has been planted in some regions, or at least suggested for planting, on this account.

Ananas sativus Schult. *Piña. Pineapple.* Cultivated occasionally in the region, and a large number of varieties are being tested at Quebrada Seca and elsewhere in the Tela district. Many

regions of Central America produce pineapples of superior quality. The plant is probably a native of Brazil, although it has been under cultivation in Mexico and Central America for a long time, perhaps before the conquest. I noted pineapples naturalized in woods or thickets in a few places about Tela.

CATOPSIS Griseb.

Catopsis brevifolia Mez & Werckle. Plants small, glabrous, bright green, unarmed, seldom more than 20 cm. high; leaves broad and thin, rather succulent, acute or rounded at the tip, about 10 cm. long; staminate and pistillate flowers borne on separate plants, arranged in simple or panicled spikes, the flowers comparatively small and inconspicuous; ovary superior; fruit a small capsule containing seeds with hairy appendages.—Common on tree branches in wet forest; ranging to Costa Rica. The species of this genus are poorly understood, and the determination of this Honduran one is very doubtful. It is probable that there have been described from Central America a good many more species of *Catopsis* than can be distinguished definitely.

TILLANDSIA L.

These "air-plants," as they are sometimes called, form the largest genus of the family. They are mostly stemless epiphytes (*T. usneoides* being an exception in having long branched stems) with dense clusters of basal leaves of various forms, generally covered with scales which prevent rapid evaporation from the leaf surface. The flowers are arranged in dense or lax spikes which are variously disposed. The ovary is superior, and the fruit a capsule containing many seeds with hairy appendages. The inflated leaf bases of some species are inhabited regularly by savage ants. In various parts of Central America these plants are called "cogollos," "gallos," "gallitos," "chivitos," or simply "parásitos."

Tillandsia bulbosa Hook. Plants small, 20 cm. high or less, covered with minute, closely appressed, scurfy scales; leaves much enlarged at the base, broad and inflated, giving the plant a bulblike base, the blades long and very narrow, often inrolled; inflorescence a cluster of 2–3 short spikes with closely appressed, green bracts.—Frequent on trees in wet forest; widely distributed in tropical America. This is one of the species which commonly is infested by ants.

Tillandsia compressa Bert. *Plate XVIII.* Plants rather large, with numerous leaves, these thin, long, narrow, broadened but not inflated at the base, minutely scurfy; flower spike simple, large, stalked, strongly compressed, green, 4 cm. wide, the numerous closely overlapping bracts sharply keeled.—On trees in wet forest; ranging to Costa Rica, the West Indies, and northern South America.

Tillandsia festucoides Brongn. Plants mostly 30 cm. high or less, often forming small clumps; leaves very numerous, slightly widened, thick, and hard at the base, very slender and almost filiform above; spikes few, little compressed, clustered at the top of the scape, erect or nearly so, the bracts green or reddish; petals blue.—Common on trees in wet forest; frequent in Central America, extending to the West Indies and Florida.

Tillandsia filifolia Cham. & Schlecht. Plants small, 20 cm. high or less; leaves very numerous, almost filiform, from a broad hard base, minutely scurfy; flower spikes few, very slender, about 3 mm. thick, with appressed bracts, clustered, erect or ascending.—Frequent on trees in wet forest; distributed from Mexico to Costa Rica. The leaves are shorter and much more slender in this than in any of the other species here listed (except the very different *T. usneoides*).

Tillandsia monadelpha Baker. Plants about 30 cm. high; leaves numerous, thin, green, nearly glabrous, soft, long-tapering to the tip, flat; flower spike simple, long-stalked, about 3 cm. broad in flower, the bracts and capsules spreading, not appressed; capsules large, 4 cm. long; bracts and capsules green.—Common on trees in wet forest; ranging to the Guianas.

Tillandsia pruinosa Sw. Plants small, less than 20 cm. high, densely covered with very coarse, loose scales; leaves with short narrow blades, the bases much enlarged and inflated, giving the plant a bulblike base; spike sessile or short-stalked, simple, the dull reddish bracts loosely appressed; flowers violet.—Occasional on trees in wet forest; occurring in Mexico, the West Indies, and South America, but apparently new to Central America. This species is easy to recognize because of the loose coarse scales.

Tillandsia sublaxa Baker. Plants 20–30 cm. high; leaves rather soft and thin, much broadened at the base, covered with minute grayish scales; spike simple, long-stalked, somewhat compressed, the rather few bracts green, often tinged with purple.—Frequent on trees in wet forest; also in the West Indies.

Tillandsia usneoides L. *Pashte. Spanish moss, Grandfather's beard.* Plants very slender, with elongate stems; leaves filiform, densely grayish-scaly.—Pendent from trees in wet forest; widely distributed in the tropical and subtropical parts of the Americas. This is the familiar Spanish moss which festoons the live oaks and other trees of the southern United States, as far north as Virginia. It is common in some parts of Central America, but in other regions which are, apparently, equally suited to its growth, it is absent. The soft plants are used for stuffing cushions and mattresses. In the United States the plant is the basis of an industry of some importance, the cleaned stems being employed for mattress making.

VRIESIA Lindl.

The plants of this genus are epiphytes with broad soft unarmed leaves. The inflorescence is a simple spike in the species listed here. The ovary and capsule are superior, the seeds having hairlike appendages.

Vriesia disticha (L.) Standl. Plants about 20 cm. high; leaves numerous, rather succulent, 2 cm. wide, glabrous and pale green, tapering or blunt at the tip; spikes short and broad, 5 cm. thick or more, with few broad, green or red bracts.—Frequent on trees in wet forest; distributed from Guatemala to northern South America.

Vriesia guadeloupensis (Baker) Mez. Plants tall, sometimes a meter high, bright green; leaves 2.5–5 cm. wide; spikes much elongate, with numerous broad bracts.—On trees in wet forest; also in the West Indies. The determination of the Honduran specimens is very doubtful, and they may represent an undescribed species, but the material available is too incomplete to permit a definite decision.

COMMELINACEAE. Dayflower Family

These plants are annual or perennial, succulent, glabrous or pubescent herbs, their leaves commonly lanceolate or ovate and acute. The small or large and showy flowers, in cymes or umbels and usually subtended by spathelike or leafy bracts, have 3 sepals and 3 petals which usually are thin and quickly wither into a formless mass. There are commonly 6 stamens, and a superior 2–3-celled ovary. The fruit is a capsule, with one or few seeds in each cell.

CALLISIA L.

Callisia repens L. A small, slender, nearly glabrous plant, the stems rooting at the nodes; leaves sessile, ovate or ovate-oblong, 1–3

cm. long, acute or acuminate, commonly cordate at the base, ciliolate; flowers white, the leaflike bracts which subtend them forming a long slender interrupted spikelike inflorescence; capsule 6-seeded.—Occasional on open banks, forming dense mats; widely distributed in tropical America. The stems often are purplish.

CAMPELIA L. Rich.

Large stout erect plants with coarse, simple or branched, very leafy stems; leaves mostly oblanceolate, long-acuminate; peduncles long and axillary, the flowers densely clustered, subtended by 2 large leaflike bracts; sepals in age becoming fleshy and enclosing the 3-celled capsule, which has 1 or 2 seeds in each cell.

Campelia hirsuta Standl. Plants erect, simple, about 60 cm. high; leaf sheaths and blades densely hirsute with spreading stiff tawny hairs; bracts much less acuminate than in *C. Zanonia;* flowers white.—In wet forest, infrequent; known only from the vicinity of Lancetilla. The stems are usually dark red or purplish.

Campelia Zanonia (L.) HBK. A coarse erect herb a meter high or sometimes taller, nearly glabrous or pubescent with short and mostly appressed hairs; leaves with very long and narrow tips; flowers purple or white; fruit dark blue.—Frequent in wet forest; widely distributed in tropical America. In Salvador, where the plant is employed as a remedy for venereal diseases, it is called "caña de Cristo" and "coyontura."

COMMELINA L. Dayflower

Fleshy herbs; flowers subtended by a spathe which is compressed and flat, its margins distinct or united; ovary 2–3-celled.

Commelina elegans HBK. A much-branched herb, ascending or spreading or sometimes nearly erect, glabrous or sparsely pubescent; leaves lance-oblong, acuminate; margins of the spathe united high up; flowers pale blue, open in the morning.—Common in wet thickets or on open banks; widely distributed in tropical America. Called "codillo" (little elbow, in reference to the geniculate stems) in Panama, "coyontura" in Salvador, and "conchita de lazo" in Nicaragua.

Commelina elegans, var. **hirsuta** Standl. Leaves, sheaths, and spathes densely hirsute with stiff spreading hairs.—In wet thickets; known only from this region, but probably of wider distribution.

Commelina longicaulis Jacq. Plants more slender, decumbent and rooting; spathe small, with distinct, not united margins; flowers pale blue.—Common in thickets and open fields, a frequent weed of banana plantations; widely distributed in tropical America. Sometimes called "verdolaga" in Panama.

DICHORISANDRA Mikan

Dichorisandra hexandra (Aubl.) Standl. An erect herb a meter high, or sometimes a vine as much as 6 meters long, trailing over shrubs and trees, nearly glabrous; leaves lance-oblong, sessile, long-acuminate; flowers purple, in small terminal panicles; ovules 3–5 in each cell, the seeds arillate.—Common in wet forest; ranging from Guatemala to South America.

LEPTORRHOEO Clarke

Leptorrhoeo filiformis (Mart. & Gal.) Clarke. Plants small, very slender, decumbent, nearly glabrous; leaves oblong or linear, sessile, 1–4 cm. long; flowers white or pale blue, very small, in 3–6-flowered, terminal and axillary umbels; seeds 1 in each cell.—Growing in sand under coconut palms at Tela; extending from Mexico to South America.

RHOEO Hance

Rhoeo discolor (L'Hér.) Hance. *Señoritas embarcadas.* A fleshy, short-stemmed, low herb, about 20 cm. high; leaves few, oblong-lanceolate, 20–30 cm. long and 3.5 cm. wide, usually dark purple beneath; inflorescence bracted, the flowers almost hidden within the large compressed bracts.—Cultivated occasionally for ornament; native of tropical America.

TINANTIA Scheidw.

Tinantia leiocalyx Clarke. An erect annual, commonly much branched, sometimes a meter high; leaves broadly ovate, acuminate, 6–15 cm. long, finely pubescent beneath, often subcordate at the base; inflorescence umbel-like, terminal, the flowers pedicellate; sepals glabrous, 12–14 mm. long; leaves and flowers pale green.—A rather weedy plant, growing on banks and in open fields; occurring in Central America and Mexico.

TRADESCANTIA L.

Plants erect or prostrate, the leaves narrow or broad; flowers usually in umbels, the umbels often subtended by leaflike bracts;

stamens 6, all fertile; capsule 3-celled, with normally 2 seeds in each cell. The Central American species are very different in appearance from most of those inhabiting the United States.

Tradescantia cordifolia Sw. Plants very slender, small, procumbent; leaves ovate, 2 cm. long, glabrous, acute, rounded or subcordate at the base; umbels small, few-flowered, the sepals 2 mm. long; petals white; leaves pale green.—Occasional about Progreso in wet thickets or on shaded banks; widely dispersed in tropical America.

Tradescantia cumanensis Kunth. A rather coarse perennial, nearly glabrous, the stems decumbent or sometimes clambering and as much as 1.5 meters long; leaves lanceolate or narrowly oblong-lanceolate, 5–8 cm. long; peduncles terminal, mostly shorter than the leaves; petals white.—Common in wet thickets; ranging from Mexico to South America. Called "palm-grass" by the Barbadians living in the Canal Zone.

Tradescantia geniculata Jacq. Stems slender, decumbent, simple or branched; leaves oblong-lanceolate to ovate, 3–6 cm. long, acute, densely pilose beneath; flowers white, in very slender terminal panicles; sepals 2–3 mm. long.—Occasional in wet thickets, sometimes in cultivated ground; widely distributed in tropical America.

Tradescantia gracillima Standl. Plants very slender, ascending or procumbent; leaves broadly ovate, acute, 2–3 cm. long, very unequal at the base, sparsely pilose above, glabrous beneath; flowers white, in small umbels, the umbel subtended by two leaflike bracts.—In wet thickets near Tela; known only from this region.

ZEBRINA Schnizl.

Zebrina pendula Schnizl. Plants prostrate or procumbent, glabrous or abundantly hairy; leaves ovate-oblong or ovate, 3–10 cm. long, acuminate, pubescent or pilose, at least beneath, usually purplish beneath and striped with green and silver above, or sometimes wholly green; flowers clustered, subtended by 2 large leaflike bracts; petals rose-purple; capsule 3-celled, with 1 or 2 seeds in each cell.—Frequent on shaded banks or in wet thickets; occurring in Mexico, Central America, and the West Indies. Called "matalí" and "sangría" in Salvador. This is one of the plants grown commonly for ornament in the United States under the name of "Wandering Jew."

PONTEDERIACEAE. Pickerel-weed Family

The members of this group are herbs, glabrous or nearly so, which grow in water or mud; the leaves have sheathing, petioled and entire, usually heart-shaped or kidney-shaped blades. The small or large and showy flowers, subtended by a green spathe, have a 6-parted perianth and 3 or 6 stamens which are inserted on the tube of the perianth. The fruit is a many-seeded capsule or a 1-seeded utricle.

HETERANTHERA R. & P.

Heteranthera reniformis R. & P. A succulent creeping herb; leaves long-petioled, kidney-shaped, broadly rounded at the apex; spathe few-flowered, the small flowers white, with 3 stamens.—Frequent in marshes and in mud about the edges of pools and streams; widely distributed in tropical America.

PONTEDERIA L.

Pontederia cordata L. *Pickerel-weed.* A coarse erect herb a meter high; leaves deeply cordate at the base; flowers pale purple, in a long dense spike; stamens 6; fruit 1-seeded.—Frequent in marshes and along streams; widely distributed in tropical America, and common in many parts of the United States. Called "balsa" in Salvador, and "lechuga de agua" in Guatemala.

LILIACEAE. Lily Family

ALLIUM L.

Allium Cepa L. *Cebolla. Onion.* Planted commonly in gardens.

Allium sativum L. *Ajo. Garlic.* Planted frequently, and used all too generally as a flavoring for food.

ASPARAGUS L.

Asparagus plumosus Baker. Grown for ornament. Known in Salvador by the name "vela de novia."

DRACAENA L.

Dracaena americana Donn. Smith. *Izote.* A tree 4.5–9 meters high, with thick trunk and few thick branches, the branchlets densely leafy; leaves linear, 20–30 cm. long, long-tapering, bright green, glabrous; flowers very small, creamy white, in large terminal panicles; fruit yellowish green, 1.5–2.5 cm. in diameter, containing 1 or 2

large globose seeds.—Frequent in wet forest on the lower slopes; extending to British Honduras and Costa Rica. The name "parasillo" is reported from Honduras, but there is doubt regarding its application and derivation. The tree is an interesting one because it is the only American representative of a large genus otherwise restricted to the Old World. In habit and aspect the trees resemble yuccas.

TAETSIA Medic.

Taetsia fruticosa (L.) Merrill. (*Cordyline terminalis* Kunth.) A native of the East Indies, grown here as elsewhere in Central America for ornament. It is a tall half-woody plant with broad lanceolate green leaves, and small and inconspicuous whitish flowers.

Taetsia fruticosa (L.) Merrill, var. **ferrea** (Baker) Standl. A common form with red or purple leaves.

YUCCA L.

Yucca elephantipes Regel. *Izote. Yucca.* A tree 3–10 meters high with few thick branches; leaves very numerous, daggerlike, sometimes a meter long, thick and stiff; flowers creamy white, large, bell-shaped, in huge erect panicles.—Planted about Tela; perhaps native of Mexico, but planted generally in Central America. Called "palmito" in Panama and "itabo" in Costa Rica. The young flowers are esteemed as an article of food everywhere in Central America. Usually they are fried with eggs, and when so prepared they are very palatable.

SMILACACEAE. Sarsaparilla Family

SMILAX L.

The plants are large woody vines, their stems usually armed with coarse prickles, the leaves leathery, usually entire, and with 3–7 conspicuous longitudinal nerves. The flowers are small and greenish or brownish, the two sexes separate, arranged in umbels in the leaf axils, and with 6 stamens. The fruit is a globose, black or red berry containing 1–6 seeds. Closely related and very similar species growing in the United States are known by the names "catbrier," "greenbrier," and "horsebrier."

Smilax domingensis Willd. *Zarza, Corona de Cristo.* A large coarse glabrous vine, the stems with but few prickles, roundish, not angled, in cross section; leaves oblong to ovate, very thick, obtuse or acutish, cordate to acutish at the base; stalks of the umbels shorter

than the petioles; berries black or dark purple.—Frequent in thickets about Tela and Progreso; widely distributed in tropical America.

Smilax mollis Willd. *Pate.* A large unarmed vine, brownish-pubescent throughout; leaves on very short petioles, oblong to narrowly ovate, acute or acuminate, cordate at the base; usually 5-nerved; berries red.—Common in thickets and swamps; widely distributed in tropical America. The large yamlike roots are used for poisoning fish. The vernacular name is derived from an Aztec word signifying "medicine."

Smilax ornata Lem. *Zarza, Zarzaparrilla.* A very large, woody vine, glabrous, the thick woody stems sharply 4-angled, armed with large stout prickles; leaves short-petioled, often very large, oblong to ovate, acute to rounded at the apex, the larger ones mostly cordate at the base and often prickly beneath; berries white.—Common in thickets; occurring also in Guatemala and probably in other Central American countries. This is one of the few species of *Smilax* which are known definitely to yield commercial sarsaparilla. Although that drug is produced in many parts of tropical America, very little is known concerning the species from which it is obtained. Most species of *Smilax* are worthless for the purpose. Sarsaparilla is obtained from the roots, which are dried for export. It is employed chiefly for flavoring beverages, and to a limited extent as a remedy for rheumatism and scrofulous and cutaneous diseases.

Smilax panamensis Morong. A large woody glabrous vine with few prickles; leaves slender-petioled, oblong to narrowly ovate, 3–5-nerved, acute at the apex, acute to rounded at the base; stalks of the umbels mostly longer than the petioles, the flowers small, green.—Occasional in wet thickets; ranging from Guatemala to Panama. Called "zarza" in Panama.

HAEMODORACEAE. Bloodwort Family

XIPHIDIUM Aubl.

Xiphidium caeruleum Aubl. *Plate XIX.* A perennial herb; leaves resembling those of iris, linear, long-tapering, 2-ranked, inserted with their edges toward the stem, glabrous; flowers small, whitish, in terminal panicles, with 6 perianth lobes and 3 stamens; fruit a 3-celled, many-seeded, dull red berry.—Frequent in wet forest; widely distributed in tropical America. Called "palmita" in Panama, and "palma" and "palma del norte" in Salvador. Small plants sometimes are produced in the inflorescence.

AMARYLLIDACEAE. Amaryllis Family

The plants have basal leaves which are more or less evidently parallel-veined, and scapose stems. The perianth is 6-parted, and the flowers have normally 6 stamens. The ovary is inferior, the fruit a capsule.

AGAVE L.

Agave sisalana Perrine, f. **armata** Trel. *Mescal.* A large coarse plant with a huge cluster of basal leaves, these long and narrow, rather thick and fleshy, sharp-pointed, armed along the margins with short prickles; inflorescence very tall, the flowers greenish yellow.—Planted in the Tela region, and naturalized in thickets, perhaps about the sites of former dwellings; native probably of Yucatan. Called "maguey" in the interior of Honduras. The leaves produce a tough fiber, which is known in the trade as sisal, sisal fiber, or sisal hemp, its name being derived from the port of Sisal in Yucatan, from which the fiber formerly was exported. The fiber of the various Agaves and of the related genus *Furcraea* is employed commonly in all parts of Central America for making twine, rope, hammocks, and other articles. The manufacture of hammocks is an industry of importance in certain parts of Honduras.

The genus *Agave* has but few representatives in Central America, but in Mexico it is represented by a large number of species. A handsome native *Agave* grows abundantly on the dry hills of the interior of Honduras.

CRINUM L.

Crinum erubescens Soland. *Lirio.* A succulent scapose glabrous herb with bulbs; leaves broad, strap-shaped; flowers few, clustered at the top of the scape, their slender tube 10–15 cm. long, the 6 segments lanceolate, scarcely half as long as the tube, white; stamens purple-red.—Common in marshes near the beach; widely distributed in tropical America.

It is probable that the related genus *Hymenocallis* is represented in the Tela region, but I did not find plants in flower.

DIOSCOREACEAE. Yam Family

DIOSCOREA L.

Slender, herbaceous or rarely somewhat woody vines; leaves opposite or alternate, commonly ovate-cordate, ribbed and netted-veined, entire, petioled; flowers small and commonly greenish, usually

dioecious; arranged in axillary racemes or spikes, the perianth 6-parted; stamens 6 or 3; fruit a deeply 3-angled capsule, with 1 or 2 seeds in each of the 3 cells.

Dioscorea alata L. *Name, Name blanco. White* or *water yam.* Stems more or less 4-winged or 4-angled; leaves usually opposite, broadly cordate, 5–7-nerved, glabrous; flowers minute, in whorled and frequently panicled spikes; stamens 6; capsule 2.5–3 cm. long.—Cultivated, and sometimes naturalized in thickets; probably native of scuthern Asia. This species is grown commonly in Central America for its large roots, which usually are eaten boiled. It is probable that one or more additional species of the genus are in cultivation in Honduras.

Dioscorea bulbifera L. *Papa del aire. Air potato.* A large vine with ovate-heart-shaped leaves, bearing in the axils of the leaves large compressed fleshy tubers which sometimes weigh several pounds.—A native of tropical Asia, sometimes cultivated in Honduras for the edible tubers. Plants were found growing wild in thickets not far from Lancetilla.

Dioscorea convolvulacea Cham. & Schlecht. A slender vine; leaves 9–11-nerved, acuminate or cuspidate-acuminate, cordate, puberulent or pilosulous beneath, at least along the nerves; flowers pale green, 3–4 mm. long; stamens 3.—In wet thickets near Progreso; extending to southern Mexico.

Dioscorea esurientium Uline. A large slender vine; leaves cordate or triangular-cordate, sometimes hastate-lobed at the base, 9–11-nerved, usually sparsely puberulent beneath but sometimes glabrous; flowers green, 2 mm. long, in very long, slender racemes; stamens 3.—In wet thickets near Progreso; ranging from Guatemala to Costa Rica.

Dioscorea macrostachya Benth. A large slender herbaceous vine; leaves broadly cordate, acute or acuminate, 7–9-nerved, with a deep or shallow basal sinus; staminate flowers scarcely 2 mm. long, clustered and forming very long and slender spikes, purplish green or dark brown-red; stamens 6; capsules 2.5–4 cm. long and broad.—Frequent in wet forest or thickets; ranging from Panama to Mexico.

Dioscorea sp. Imperfect material was collected in the Lancetilla Valley of an evidently distinct species which may be undescribed. The large thick leaves are very densely pubescent beneath.

IRIDACEAE. Iris Family

MARICA Ker

Marica gracilis Herb. A tall herb with broad, linear, conspicuously 1-ribbed leaves; scapes broadly winged, the flowers in a cluster subtended by leaflike spathes; flowers up to 5 cm. broad, the segments white, veined with yellow; fruit a capsule, the seeds with a bright red aril.—In mountain forest, rare; ranging to Mexico and South America.

MUSACEAE. Banana Family

HELICONIA L.

These plants are of considerable interest because of the fact that they are the only native Central American relatives of the banana. Numerous species of them occur in Central America, and they form a conspicuous part of the vegetation of the lowlands, reaching their greatest abundance, perhaps, in Panama, where some of them form all but impenetrable thickets. Some of the *Heliconia* thickets, in fact, are so dense that I doubt that it is possible to force a way through them without a machete.

Except in their general habit and in the appearance of their leaves, the plants do not resemble the banana very closely. Their inflorescence is a large, erect or recurved spike, its large colored bracts arranged in two ranks, the flowers in dense clusters within them at their base. The fruits are small and berrylike, often blue when mature. The plants are of no economic importance, except that their leaves are used for wrapping various objects, when banana leaves are not at hand, and they may be employed also for roofing temporary shelters. It is reported that mosquitoes breed in the water held within the bracts of some species.

It is quite probable that more species occur in the Tela region than are listed here.

Heliconia Bihai L. *Plate XX.* A coarse plant about 2 meters tall, glabrous or nearly so, with large thin green leaves somewhat resembling those of a canna, but larger; inflorescence erect, very thick and heavy, the bracts broad, strongly compressed, closely set, spreading almost at right angles, greenish yellow, spotted and shaded with red, the edges green; fruit pale yellow, becoming bright blue.—Frequent in wet thickets; widely distributed in tropical America. This is, I think, the handsomest of all the Central American Heliconias with which I am familiar, because of the rich and beautiful

coloring of the spikes. Like other species, it usually is called "platanillo" in Central America, and by the West Indians "wild plantain" or "wild banana."

Heliconia crassa Griggs. *Plate XXI.* A comparatively small plant, but sometimes nearly 2 meters high, slender, the stems very leafy throughout their length; leaves sessile or nearly so, small, narrowly oblong, bright green; inflorescence small, the few bracts short, narrow, reddish orange with green tips; flowers cream-colored. —Frequent in deep mountain forest; occurring also in Guatemala. Perhaps not different from *H. choconiana* Wats. This species is much less conspicuous than the others, but nevertheless a very attractive plant. It begins to flower in March.

Heliconia latispatha Benth. Plants coarse, often 2 meters high, with few leaves, the leaves large and broad, green, thin; inflorescence erect, the bracts narrow, widely spaced, spreading at right angles, long and attenuate, orange-yellow.—Common in wet thickets and in forest; a common species of Central America. Called "platanillo" and "guacamaya" in Panama. In Salvador sometimes called "cuchillos."

Heliconia librata Griggs. *Bijagüillo.* Plants 2 meters high or less, the large leaves thin and green; inflorescence erect, almost triangular, broadest at the base and rapidly narrowing upward, the bracts long and narrow, closely set, widely spreading, yellow or straw-colored; fruits blue.—Occasional in wet mountain forest; growing also in Guatemala.

Heliconia Mariae Hook. *Bijagüillo. Beefsteak heliconia.* Plants very large, usually 3 meters high or more, much like the banana plant in size and habit, with huge leaves; inflorescence very large and pendent, often 60 cm. long or more, narrow, composed of numerous broad, short, closely overlapping bracts, dull deep red.—Frequent in wooded swamps near the coast; ranging from Guatemala to Panama. This is the largest of all the Central American Heliconias.

MUSA L.

Musa sapientum L. *Guineo. Banana.* This species, of Old World origin, is the most important plant of the northern coast of Honduras, for upon it depends chiefly the prosperity of the country. There are extensive plantations all along the coast, and many millions of stems of the fruit are exported every year to the markets of the United States and Europe. Without the banana, the lowlands of

northern Honduras soon would be deserted by most of their human inhabitants. The variety grown here, as throughout Central America, is the Gros Michel, the common banana seen in the United States markets. Several other varieties are planted extensively in various parts of Central America for local consumption, but they are not exported, except occasionally those called "red bananas." Very few varieties appear to be grown in the Tela region, however, even by the native inhabitants.

Musa paradisiaca L. *Plátano. Plantain.* This plant is little known outside the tropics, for its fruits are seldom exported. They are normally larger than the banana, and eaten only after cooking. The plantain is one of the finest vegetables produced anywhere, and it is to be regretted that it is not procurable in the United States, except infrequently and at a high price. It is little grown in the Tela region.

ZINGIBERACEAE. Ginger Family

Large herbs with usually long and leafy stems, the leaves chiefly lanceolate or oblanceolate, furnished with large sheaths; inflorescence variously bracted, the flowers irregular, with only one fertile stamen; fruit usually more or less fleshy or berrylike.

ALPINIA L.

Alpinia speciosa (Wendl.) Schum. *Shell-flower.* A tall glabrous herb about 2 meters high, often forming dense clumps; leaves large, lanceolate; flowers large, arranged in drooping spikelike racemes, the bracts white and red, the lip of the corolla yellow, brown-red within. —Cultivated for ornament, and in Central America frequently escaping; native of the East Indies. The flowers are showy and beautiful. In Salvador the plant is called "perlas del Oriente."

COSTUS L.

These plants are tall coarse herbs, their terete stems formed by the tightly rolled sheaths of the numerous oblanceolate or obovate leaves. The flowers are arranged in dense terminal spikes which have numerous closely overlapping, thick bracts.

Costus sanguineus Donn. Smith. *Caña de Cristo.* Plants 1–3 meters high, hairy or nearly glabrous; leaves abruptly pointed; flower spikes 8–18 cm. long, the numerous broad bracts bearing a conspicuous callus on the back, obtuse or rounded at the apex, tightly

imbricated, even in fruit, red or reddish green; perianth red.—Common in thickets and forest; ranging almost throughout Central America, at least at low elevations.

This differs but little, if at all, from the following species. The members of this genus are poorly understood, and it seems improbable that all the species proposed are really recognizable.

Costus spicatus (Jacq.) Sw. *Caña de Cristo. Plate XXII.* Plants more slender, 1–2 meters high, glabrous or somewhat hairy; flower spikes mostly shorter, the bracts dull red, in age loose and somewhat spreading.—Frequent in thickets and forest; widely distributed in tropical America.

RENEALMIA L. f.

Renealmia aromatica (Aubl.) Griseb. A large coarse plant, the sterile stems 1–2 meters high, with numerous large acuminate leaves; inflorescence rising from the base of the plant, panicled, about 30 cm. high, dull red, pubescent, bracted, bearing very numerous small flowers; fruits fleshy, red or dark blue, with orange pulp.—Frequent in wet forest; widely distributed in tropical America. The plant sometimes forms small clumps or colonies.

ZINGIBER Adans.

Zingiber officinale Rosc. *Gengibre. Ginger.* Planted in gardens for its rhizomes, which furnish the ginger of commerce. Native of tropical Asia. In Central America the plant seldom if ever blossoms.

CANNACEAE. Canna Family

CANNA L.

The cannas are common and rather weedy plants of Central America, and they are widely distributed elsewhere in the tropics of both hemispheres. They all resemble closely the common cultivated forms, most of which are of hybrid origin. Some of the latter are grown for ornament in the Tela region, and generally in Central America.

Canna edulis Ker. *Bijao, Platanillo.* Plants tall, usually 2 meters high or more, forming dense clumps or thickets; flowers brick-red or orange-red.—Common in wet thickets and swampy places, often growing along streams; widely distributed in tropical America.

Canna indica L. *Platanillo.* Lower, commonly 1–1.5 meters high; flowers bright deep red.—Common in thickets or swampy places, one of the characteristic plants of abandoned banana land; widely distributed in tropical America. The broad thin leaves of the cannas often are used for wrapping food and other articles when the more serviceable banana leaves are not available.

MARANTACEAE. Arrowroot Family

A tropical family, the Central American representatives being usually coarse herbs, the leaves having sheaths and petioles and large broad blades. The flowers often are large and showy, chiefly white, yellow, or purple, and subtended by conspicuous bracts. The perianth is regular or nearly so, and there is only one fertile stamen, which is accompanied by one or more staminodia.

CALATHEA Mey.

The Calatheas are abundant plants in the lowlands of Atlantic Central America. They are large or small herbs, their flowers arranged in heads or spikes with large, opposite or spirally imbricated bracts. The ovary is 3-celled and the fruit 3-seeded, the ovary in the other genera listed here being 1-celled and the fruit 1-seeded.

Calathea altissima (Poepp. & Endl.) Koern. *Bijagüillo.* Plants large, 1.5 meters tall or more; leaves oval, very large, on long slender petioles; scape tall, naked, not bearing leaves as in most of the other species; flower spike headlike, about 8 cm. long and nearly as broad.—Occasional in wet forest; ranging from Guatemala to South America.

Calathea insignis Peters. *Bijagüillo, Liga. Plate XXIII.* Plants coarse, 1–2 meters tall, glabrous; leaves elliptic or oval, pointed, glabrous, thin; spikes elongate, 5 cm. wide, compressed, the broad soft bracts 2-ranked, pale bronze-green; perianth yellow.—Frequent in dense forest or along streams; ranging from southern Mexico to Ecuador. Called "bijagua" in some parts of Central America. The plant is a conspicuous and handsome one.

Calathea lutea (Aubl.) Mey. *Bijao. Plate XXIV.* Plants coarse, usually 2–3 meters high; leaves often very large, broad, pale beneath, rounded at the tip; spikes about 15 cm. long and 2.5 cm. thick, terete, not compressed, the broad bracts bronze-red; perianth pale yellow.—Common in wet thickets, in open swamps, or along streams, often forming large, almost pure stands; ranging through eastern Central America to South America. Called "hoja blanca"

in Panama and "hoja de sal" in Salvador. The large thin flexible leaves often are used like banana leaves for wrapping articles of food, and they are employed sometimes for temporary thatching. The plant is very abundant and conspicuous along the Tela River, and in many other localities of the region, where the huge leaves with their pale under surfaces always attract attention.

Calathea macrosepala Schum. *Bijagüillo. Plate XXV.* Plants smaller, usually 1–1.5 meters high, bright green; leaves short-pointed, green beneath; scape leafy; flower heads short or elongate, about 6 cm. long, the bracts yellowish-green, spirally imbricated, the perianth cream-colored or straw-yellow.—Common in wet forest; occurring through most of the Central American lowlands. Called "bijao" in Panama, "hoja de sal" in Guatemala, and "chufle" in Salvador. In the last country the young and tender inflorescences are cooked and eaten, being sometimes sold in the markets for the purpose.

Calathea micans (Math.) Koern. Plants small and slender, scarcely more than 60 cm. high, often forming small dense clumps or colonies; leaves elliptic-oblong, about 18 cm. long, acute or acuminate, acute at the base; scapes naked, the heads about 2 cm. long, with very few bracts; perianth pure white.—Common in wet forest; especially near the borders of streams; widely distributed in Central America.

MARANTA L.

Maranta arundinacea L. *Yuquilla, Yuquilla de monte* (the wild form). *Arrowroot.* A slender much-branched herb 1.5 meters high or less; leaves petioled, ovate or ovate-lanceolate, acuminate; flowers white, in small lax panicles.—Frequent in thickets, also in cultivation; widely distributed in tropical America. Called "sagú" in Panama, and "platanillo" and "juquilla silvestre" in Salvador. Arrowroot starch is prepared from the roots of the plant, in some regions on a large scale, and the plant is sometimes grown for this purpose in Honduras. It is seen frequently in small gardens in the Tela region.

PLEIOSTACHYA Schum.

Pleiostachya pruinosa (Regel) Schum. *Bijagüillo. Plate XXVI.* A coarse but slender plant 1–1.5 meters high, glabrous or nearly so; leaves very large, sometimes purple beneath, pointed, thin; flower spikes clustered, long and somewhat compressed, the narrow bracts

2-ranked and closely appressed, green; perianth purple.—Frequent in wet forest; ranging to South America.

THALIA L.

Thalia geniculata L. A slender glabrous herb 1.5–3 meters high; leaves very large, lanceolate to ovate, pale beneath, long-petioled, acute or acuminate, thin; flowers in very large, lax panicles, the perianth bright purple.—Common in open swamps; often forming very large and dense, pure stands; widely dispersed in tropical America. Called "platanillo" in Salvador.

ORCHIDACEAE. Orchid Family

The families of plants most commonly associated with the tropics are palms and orchids. The latter are plentiful in Central America and represented by many hundreds of species, especially in Costa Rica, but a botanist unacquainted with tropical conditions is likely to be disappointed in his search for the plants. Because search for them he must; they are not so conspicuous or abundant as to thrust themselves upon him, except in the case of a few showy species, such as *Cattleya Skinneri*, which are plentiful in certain regions.

In Central America orchids are most abundant in the higher mountains, where the rainfall is heavy and continuous throughout the year. In the lowlands the species are comparatively few, and most of the plants grow high on the branches of tall trees, where they are invisible to one walking beneath. The number of orchids collected thus far in the Lancetilla region is a small one, and no doubt much less than the number actually existing there. In addition, nearly all of them are small and inconspicuous plants, of little interest except to the botanist. Persons speaking of the abundance of showy orchids in the Tela region are likely to have in mind other epiphytes, especially the bromeliads, which very often are assumed wrongly to be orchids merely because they grow upon trees, and have flowers more showy than the majority of the orchids.

Most of the Central American orchids are epiphytes, but some are terrestrial plants. Most of them probably have a rather limited flowering season, consequently the vast majority of the plants which one may encounter are sterile, or bear capsules only.

The species of the following list have been determined by Professor Oakes Ames. He was greatly handicapped in making the determinations by the fact that so many of the specimens lacked flowers.

CAMPYLOCENTRUM Benth.

Campylocentrum micranthum (Lindl.) Rolfe. A rather coarse epiphyte, the leaves distichous, oblong, obtuse, thick and fleshy; plants without pseudobulbs, bearing numerous very large, pale, coarse, aerial roots; flowers very small, inconspicuous, in short racemes.—On trees in wet forest; ranging from Guatemala southward through tropical America.

CATASETUM L. Rich.

Catasetum maculatum Kunth. A coarse epiphyte with large pseudobulbs and broad, conspicuously nerved leaves; flowers large, with a fleshy saccate lip suggesting that of the *Cypripedium* species of the United States; inflorescence arising from the base of the pseudobulb.—On trees near Tela; widely distributed in Central America. The very sticky sap of the pseudobulbs is used locally for gluing the wood of guitars.

CRYPTARRHENA R. Br.

Cryptarrhena lunata R. Br. A small epiphyte, without pseudobulbs; leaves linear-oblanceolate, jointed to the sheathing base, 6–14 cm. long, 7–13 mm. wide, leathery, 2-ranked; flowers small, in lax racemes; lip 4 mm. long, the lateral lobes linear-subulate, curved backward, the terminal lobe bifid.—On trees in wet forest; widely distributed in tropical America. Flowers greenish yellow.

DICHAEA Lindl.

The Dichaeas constitute one genus of orchids which may be recognized readily by habit alone. The plants are epiphytes with long, mostly pendent stems which are densely leafy, the leaves being short and broad, often compressed, and with imbricated sheaths. The small and inconspicuous flowers are solitary in the axils of the leaves, their lip sessile or clawed and entire.

Dichaea muricata (Sw.) Lindl. Stems long and slender, flexible, often forming dense pendent masses; leaves 1–2 cm. long, green, rounded at the tip; pedicels about as long as the leaves, filiform; petals 5–6.5 mm. long, the lip sessile; capsule densely muricate.—Frequent on trees in wet forest; widely distributed in tropical America.

Dichaea panamensis Lindl. Plants small and erect, the leaves 1–4 cm. long, in alternating zones of longer and shorter blades, glaucous.—On trees in wet forest; extending to Panama.

ELLEANTHUS Presl

Elleanthus linifolius Presl. Plants epiphytic, forming dense clumps, the stems simple, slender, 20–30 cm. high, erect, leafy, without pseudobulbs; leaves linear, up to 12 cm. long, 1.5–3 mm. wide; flowers arranged in a dense several-flowered spike 1–2 cm. long, the flowers white, distichous; lip obovate, ciliate-denticulate, 3 mm. broad.—Frequent on trees in wet forest; widely dispersed in tropical America. The specific determination of the Honduras specimens is somewhat uncertain because of the poor condition of the material.

EPIDENDRUM L.

Plants usually epiphytic, very diverse as to habit; stems leafy, often with pseudobulbs, simple or branched; leaves commonly thick and fleshy; peduncle terminal on a leafy stem, simple or panicled; flowers medium-sized or small, racemose; sepals free, equal, commonly spreading or reflexed, the petals similar or rarely much narrower; claw of the lip appressed to the column and adnate with it into a tube, the blade spreading or 3-fid; capsule ovoid or oblong, often prominently ribbed or even winged. This is the largest genus of American orchids, consisting of about 750 species. The group is well represented in Central America, and includes some handsome and showy-flowered species.

Epidendrum anceps Jacq. Stems solitary or few together, 2-edged, up to 60 cm. long, leafy above; leaves oblong or oblong-lanceolate, 5–12 cm. long, acute; flowers greenish brown, in a short and commonly dense raceme, the pedicels 3–6 mm. long; sepals oblong, 8 mm. long; petals linear-spatulate, slightly shorter than the sepals; lip cordate-reniform, 5 mm. long, 3-lobed, with entire lobes.—On trees in wet forest; widely distributed in tropical America.

Epidendrum isomerum Schlechter. A pendent epiphyte, the stems branched, leafy, covered by the leaf sheaths; leaves linear, acute, 5.5–9 cm. long, 3–4 mm. wide; flowers solitary at the tips of the branches, sessile; sepals linear, 13 mm. long; petals slightly narrower than the sepals; lip lanceolate, subacute, 9 mm. long.—On trees in wet forest; occurring also in Guatemala.

Epidendrum nocturnum Jacq. An epiphyte without pseudobulbs, the stems rather slender, clustered, erect, 30–60 cm. high; leaves oblong to elliptic or linear-oblong, 7–15 cm. long, acute; flowers solitary or two together, on a peduncle 2–10 cm. long; sepals green, linear-attenuate, 3–6 cm. long and 2–4 mm. wide; petals

yellow, similar to the sepals; lip white, 3-cleft, 3–5 cm. long, the middle lobe setaceous.—On trees in wet forest; widely distributed in tropical America. A large-flowered and very handsome plant.

Epidendrum paleaceum (Lindl.) Reichenb. Plants with pseudobulbs; leaf only one, ensiform, subobtuse, flat; flowers spicate, pale yellowish, secund, the bracts linear-lanceolate, acuminate, thin and dry, shorter than the ovary; sepals and petals linear-lanceolate; lip similar to the petals and of the same length, fleshy, dilated at the apex.—On trees in wet forest; ranging from Guatemala to Costa Rica.

Epidendrum radiatum Lindl. Plants large, with compressed pseudobulbs, forming dense clumps; leaves few, long and narrow, 1.5–2.5 cm. wide, acutish; flowers in a dense few-flowered raceme, greenish white; ovary 3-winged; sepals oblong-lanceolate, the petals elliptic; lip very broad, 2 cm. long, cochleate, retuse and crenulate, with dark purple lines.—On trees in wet forest; occurring in Mexico and Central America. A rather conspicuous plant when in flower.

Epidendrum rigidum Jacq. Plants without pseudobulbs, often branched, the stems compressed, leafy; leaves oblong, obtuse, 3–8 cm. long; flowers green, in the axils of imbricated spathelike bracts, forming a dense spike; sepals leathery, oval, 6 mm. long; lip on the upper side of the flower, slightly longer than the sepals, rounded-ovate, obtuse, cordate at the base, undivided.—On trees in wet forest; widely distributed in tropical America.

Epidendrum Stamfordianum Batem. Plants with fusiform pseudobulbs; leaves oblong, obtuse, narrowed at the base; inflorescence radical, large and panicled; flowers pale yellowish, with a purplish spot at the base of the lip; sepals lanceolate, much narrower than the petals; lip 3-parted, the middle lobe bilobed or emarginate and fimbriate.—On trees in wet forest; a common species of Central America.

Epidendrum stenopetalum Hook. Plants without pseudobulbs, the stems flexuous, simple; leaves distichous, linear-lanceolate, emarginate, 8–10 cm. long; spikes short, terminal, 2–3-flowered; flowers bright rose-colored, the sepals oblong, acuminate, 18 mm. long; lip suborbicular, short-acuminate, unguiculate, 12–15 mm. wide.—On trees in wet forest; reported to range to northern South America.

Epidendrum strobiliferum Reichenb.f. Plants without pseudobulbs, 15 cm. high or less, the stems branched, leafy; leaves 2-ranked, fleshy, oblong or linear-lanceolate, obtuse or emarginate; spikes few-

flowered, 5–8 mm. long; sepals oblong-lanceolate, acute, 4 mm. long; petals linear; lip on the upper side of the flower, leathery, about as long as the sepals, ovate-cordate, acute, undivided.—On trees in wet forest; widely distributed in tropical America. Flowers pale green.

ERYTHRODES Blume

Erythrodes vaginata (Hook.) Ames. Plants terrestrial, 20 cm. high or less, the stems simple, leafy, erect or ascending, from a cluster of thick fleshy roots; leaves lanceolate, long-petioled, handsomely mottled with silver, thin; flowers about 6 mm. long, greenish white, arranged in a dense terminal spike.—Frequent in wet forest, often growing on mossy rocks; occurring also in Guatemala. A small but rather attractive plant, easily recognized by its mottled leaves.

HORMIDIUM Lindl.

Hormidium tripterum (Brongn.) Cogn. Plants epiphytic, freely rooting, with long creeping stems, the pseudobulbs slender, terete, 2–4 cm. long; leaves 2, oblong, 2–5 cm. long, acute, fleshy; flowers terminal, few or solitary, greenish, nearly sessile; sepals lanceolate, acute, 5 mm. long; lip reniform, white, turning dull yellow, 3-lobed, the lobes rounded.—Common on trees in forest, often forming dense mats; widely distributed in tropical America.

ISOCHILUS R. Br.

Isochilus crassiflorus Rich. & Gal. Plants without pseudobulbs, the stems slender and rather wiry, 20–35 cm. high, clustered, very leafy; leaves distichous, narrowly lanceolate, acute, thin, sessile; flowers pink, arranged in a short one-sided spike; lip clawed, oval, apiculate.—On trees in wet forest; extending to Mexico.

LEOCHILUS Knowles & Westc.

Leochilus scriptus (Scheidw.) Reichenb. f. Plants with compressed pseudobulbs; leaf one, lanceolate, fleshy, mucronate; racemes axillary, 2–3-flowered, the bracts very short, subulate; flowers green, the sepals with red spots and lines, oblong-lanceolate, acute; lip cuneate-obovate, retuse and bilobed.—On trees in wet forest; ranging to Mexico.

LEPANTHES Sw.

Lepanthes sp. A single species of this genus, as yet not described, was collected as an epiphyte in wet forest. The genus consists of

very small and inconspicuous orchids, and is well represented in the mountains of Central America.

MASDEVALLIA R. & P.

Masdevallia simula Reichenb. f. A very small epiphyte, without pseudobulbs; stems short, bearing a single linear leaf; peduncle short, 1-flowered, the flowers very small; lip minute, clawed.—On trees in wet forest; ranging to Colombia.

MAXILLARIA R. & P.

Plants epiphytic, with short or elongate stems, with or without pseudobulbs; leaves narrow, fleshy, 2-ranked; scapes or peduncles at the base of the pseudobulbs or in the axils of the leaves, solitary, 1-flowered; sepals nearly equal, the petals similar or smaller; lip concave, erect at the apex of the foot of the column, with a very short, inflexed claw, its lateral lobes erect, the middle one ovate-oblong, shorter than the sepals. The genus is a rather large one in Central America.

Maxillaria alba Lindl. Pseudobulbs distant, ellipsoid, compressed, 4–5 cm. long; leaves strap-shaped, emarginate, up to 25 cm. long, 1.5–2 cm. wide; peduncles in the leaf sheaths; sepals oblong-ligulate, 2 cm. long; lip 10–12 mm. long, elliptic, indistinctly 3-lobed. —On trees in wet forest; widely distributed in tropical America.

Maxillaria crassifolia (Lindl.) Reichenb. f. Pseudobulbs poorly developed and inconspicuous; leaves fleshy, strap-shaped, 18–30 cm. long, 1.5–2.5 cm. wide; peduncles several from the axil of each leaf; sepals oblong, slightly hooded at the tip, 1.5 cm. long; petals oblanceolate, 3 mm. broad; lip 12 mm. long, elliptical, obtuse.—On trees in wet forest; widely distributed in tropical America.

Maxillaria Friedrichsthalii Reichenb. f. Pseudobulbs oblong, strongly compressed; leaves 2 at the summit of the pseudobulb, strap-shaped, 18 cm. long or less, bilobed at the apex; flowers yellow-green, the sepals oblong, acute, 3 cm. long; lip very narrowly rhombic, neither lobed nor constricted, obtuse.—On trees in wet forest; ranging from Guatemala to Panama.

Maxillaria Macleei Batem. Plants small, with short stems, densely leafy, the leaves 3.5 cm. long or less, slender, subulate-conduplicate; pseudobulbs crowded, with a single leaf at the apex;

peduncles axillary, solitary; flowers whitish, with brown-red stripes; lip linear-spatulate.—Frequent on trees in forest; ranging from Guatemala to Panama.

Maxillaria rufescens Lindl. *Plate XXVII.* Pseudobulbs clustered, ovoid-cylindrical, 3–3.5 cm. long, at first covered with 3 or more membranous sheaths; leaves strap-shaped, 14–18 cm. long, 2–3 cm. wide, only one leaf at the top of each pseudobulb; peduncles several; flowers greenish white or creamy yellow, the sepals oblong, 2 cm. long; lip almost as long as the sepals, orange, purple-spotted, distinctly 3-lobed.—Frequent on trees in wet forest; ranging from Central America to Jamaica and South America.

Maxillaria variabilis Batem. Pseudobulbs oval, compressed, bearing a single leaf; leaves linear-ligulate, obtuse and emarginate; flowers axillary, solitary, deep purple; sepals linear-oblong, acute; lip oblong, retuse, fleshy, contracted on each side at the middle.—On trees in wet forest; ranging to Mexico.

MORMOLYZE Fenzl

Mormolyze ringens (Lindl.) Schlechter. Plants with pseudobulbs, forming large dense clumps, the pseudobulbs oval, somewhat compressed, bearing a single leaf at the apex; leaves strap-shaped, 30 cm. long and 3 cm. wide or smaller, obtuse, fleshy; scapes very slender, erect, 1-flowered, the flowers dull yellow with purple-brown veins; sepals narrow, 15–18 mm. long; lip dark red-brown, 3-lobed, 1 cm. long.—On trees in wet forest; ranging to Mexico.

NOTYLIA Lindl.

Notylia sp. Material of this genus, but not determinable as to species, was collected near Lancetilla. The plants are epiphytes.

ONCIDIUM Sw. Butterfly Orchid

Epiphytic plants with or without pseudobulbs; stems leafy, usually short; leaves 3-edged or flat; peduncles lateral, usually elongated and branched; sepals almost equal, spreading or reflexed, free or the lateral ones connate nearly to the apex; lip attached to the base of the column, its middle lobe very broad, emarginate or bifid. Species of this genus are common in most parts of Central America. They are noteworthy for their often large panicles of bright yellow flowers, which, by their form, suggest butterflies. Many of the plants are exceedingly showy and beautiful when in flower.

Oncidium ascendens Lindl. Leaves pendent, subterete, very thick and fleshy, stiff, as much as 60 cm. long or more; inflorescence paniculate, many-flowered, the flowers bright yellow, blotched with dark red; sepals and petals obovate, obtuse, concave; lateral lobes of the lip short, the middle lobe reniform, emarginate.—Growing on trees near Tela; widely scattered in Central America.

Oncidium pusillum (L.) Reichenb. f. Plants very small, commonly 10 cm. high or less; leaves equitant, like those of an iris; pseudobulbs none; peduncle 1–2-flowered; sepals and petals with red spots; lip with a reniform middle lobe, 13 mm. wide, bright yellow, dotted with red.—Growing on slender branches in wet thickets; widely distributed in tropical America. This is one of the most attractive of the orchids of Central America, particularly because of its diminutive size and brilliant flowers. Often the plants are scarcely more than 3 cm. high, and the flowers are frequently as large as all the rest of the plant. This species grows commonly on small branches or twigs, rather than on the large limbs preferred by most epiphytic orchids. Often it is found in abundance on cacao bushes.

ORNITHOCEPHALUS Hook.

Ornithocephalus sp. A specimen of this genus was collected, but since it is sterile, it is not possible to recognize the species represented. These plants have thick and fleshy, equitant leaves, arranged like those of an iris. The very small, yellowish flowers have a certain resemblance to a bird's head, hence the generic name.

PLEUROTHALLIS R. Br.

Epiphytic plants, most of them small and inconspicuous, without pseudobulbs, the stems clustered or the plants with creeping rhizomes, the stems with one leaf at the apex; racemes one to several, at the base of the leaf within the sheath, usually, several- or many-flowered, the flowers mostly small or minute, commonly on one side of the raceme; sepals equal or nearly so, erect or spreading; petals shorter or narrower than the sepals; lip commonly shorter than the sepals, generally contracted and jointed with the base of the column, 3-lobed, the lateral lobes erect, embracing the column, or small and toothlike. This American genus is a very large one, containing nearly 600 species, many of which grow in Central America, chiefly in the mountains. The plants are mostly small and very inconspicuous ones.

Pleurothallis Brighamii Wats. Stems clustered, about 7 cm. high; leaves oblong, obtuse, thick and fleshy; racemes equaling or shorter than the leaves, few-flowered; sepals yellow, with purple-brown stripes.—Collected about Lancetilla by Oakes Ames in 1923; extending to Guatemala and Panama.

Pleurothallis hondurensis Ames. Rhizome creeping; leaves narrowly lanceolate, 7.5–10 cm. long or more, 13–15 mm. wide, attenuate to each end, acute at the apex; peduncles fasciculate, about 8-flowered, the raceme 4–5 cm. long, the flowers fleshy, short-pedicellate; lateral sepals yellowish, striped with purple, 9 mm. long; petals 3 mm. long, oblong, acute; lip yellowish, 5 mm. long, 2 mm. wide, lobed on each side near the base, conspicuously 3-nerved.—On trees in wet forest; known only from Honduras. The species was described from material collected along the Tela River.

Pleurothallis pantasmi Reichenb. f. Material related to this species, but doubtful on account of its poor condition, was collected near Lancetilla. The species occurs in Nicaragua.

Pleurothallis peperomioides Ames. Specimens related to this species, but doubtful because of their poor condition, were collected near Lancetilla. The species was described from Costa Rica.

Pleurothallis periodica Ames. Rhizomes very short, the stems densely clustered; leaves narrowly oblanceolate, 2.5–5 cm. long, 3.5–8 mm. wide; peduncles elongate, exceeding the leaves, very slender, bearing several bracts which subtend the flowers, these opening in succession, slender-pediceled; lateral sepals 8 mm. long, cohering to about the middle; petals 3.5 mm. long; lip 4 mm. long, short-clawed, oblong, rounded at the tip, 3-nerved.—Apparently frequent, growing on trees in wet forest; ranging to Costa Rica.

Pleurothallis pruinosa Lindl. Plants small, 5–7.5 cm. high, the stems densely clustered; leaves linear-lanceolate to narrowly oval, 3.5 cm. long and 6 mm. broad or smaller, sessile; raceme solitary, about 6-flowered, shorter than the leaf; sepals broadly ovate, 3 mm. long; lip half as long as the sepals, shortly clawed, the limb triangular. —On trees in deep forest; ranging to northern South America and the West Indies. Flowers very pale green.

Pleurothallis Purpusii Schlechter. Growing on trees in wet forest; ranging to southern Mexico.

Pleurothallis sertularioides (Sw.) Spreng. Rhizomes long and creeping; leaves oblong or narrowly oval, 1.5–2.5 cm. long; peduncles

usually 1-flowered, scarcely equaling the leaves; flowers straw-colored or pale green, the sepals 4 mm. long, 1-nerved; lip less than 3 mm. long, sessile, with minute square auricles at the base.—On trees in forest; also in the West Indies.

POLYSTACHYA Hook.

Polystachya minor Fawc. & Rendle. Plants epiphytic, 30 cm. high or less, the pseudobulbs 1–2 cm. long; leaves few, 2-ranked, oblong-ligulate, 7–20 cm. long; flowers in terminal, simple or branched, dense racemes, yellowish white; sepals 3-nerved, apiculate, 2.5–3 mm. long; lip on the upper side of the flower, 3-lobed.—Occasional on trees; extending to the West Indies and northern South America.

PRESCOTTIA Lindl.

Prescottia stachyodes (Sw.) Lindl. Plants terrestrial, with a cluster of fleshy roots, 30–60 cm. high; leaves basal, long-petioled, the blades oval or broadly ovate, acute or acuminate, 7–16 cm. long; flowers small, pale green, forming a long slender spike; sepals obtuse, 1-nerved, about 3 mm. long; lip 7-nerved, auricled.—Occasional in wet deep forest; widely distributed in tropical America.

SCAPHYGLOTTIS Poepp. & Endl.

Scaphyglottis cuneata Schlechter. Plants epiphytic, erect, branched, the pseudobulbs very slender and resembling stems, the new ones arising near the summit of the old ones; leaves narrowly oblong, obtuse, small, fleshy, mostly 2–3 cm. long; flowers very small, white, clustered at the top of the pseudobulbs; lip dark purple-red.—Frequent on trees; native also in Guatemala.

SOBRALIA R. & P.

Usually large plants, epiphytic or sometimes terrestrial, without pseudobulbs; leaves comparatively broad and thin, conspicuously nerved, sessile; flowers very large, in terminal racemes, or the raceme reduced to a single flower; lip large, concave, undulate or fimbriate, undivided or bilobed. The genus contains some of the most beautiful of the Central American orchids, the flowers being large and very handsomely colored. Unfortunately, the flowers are ephemeral, often opening in the morning and, unless fertilized, closing by noon. The name "flor de un día" is applied to the plants in certain regions of Central America.

Sobralia decora Batem. *Plate XXVIII.* Plants slender, about 60 cm. high; flowers appearing one at a time, rose-red, 6 cm. long.—On trees in wet forest; widely distributed in Central America.

Sobralia fragrans Lindl. Plants 40 cm. high or less, the slender stems 2-edged; leaves linear-lanceolate, attenuate; flowers 4 cm. long, pinkish white (reported also as yellow).—Occasional on trees in wet forest, forming dense clumps; ranging from Guatemala to Colombia.

SPIRANTHES L. Rich.

Spiranthes costaricensis Reichenb. f. Plants epiphytic or terrestrial, with pale green leaves; flowers white.—Collected in the region in 1923 by Oakes Ames; growing here as a terrestrial plant; ranging to Costa Rica.

Spiranthes Prasophyllum Reichenb. f. Plants terrestrial, the leaves basal, oblanceolate, acute or acuminate, thin, petioled; flowers green, arranged in a dense bracted spike; sepals acute, pilose outside; lip sagittate, clawed.—Growing on a log in dense wet forest; occurring also in Guatemala.

STELIS Sw.

Stelis gracilis Ames. Plants perhaps referable to this species were collected near Lancetilla. The plant is a small epiphyte which was described from Guatemala.

TRIGONIDIUM Lindl.

Trigonidium Egertonianum Batem. *Plate XXIX.* Plants epiphytic, forming dense clumps; pseudobulbs short, broad, much compressed; leaves long and strap-shaped; scapes long and slender, bearing a single flower; sepals large, all similar, 2.5 cm. long or more, pale greenish tinged with bronze and with fine reddish lines; petals and lip shorter than the sepals.—Frequent on trees; widely distributed in Central America. A rather handsome orchid because of its large flowers, which, however, are rather inconspicuously colored.

VANILLA Sw.

Vanilla fragrans (Salisb.) Ames. *Vainilla. Vanilla.* A large vine; leaves thick and fleshy, oblong, acute; flowers large, pale green throughout.—Frequent in wet forest; widely distributed in tropical America. Vanilla is rather common in the Tela region, but it is not gathered here for export, so far as I know, nor is it of much importance

in Central America generally. The dried seed-pods, which are long and cylindrical, are the "vanilla beans" of commerce, from which vanilla essence is prepared. Most of the commercial vanilla is the product of plants cultivated in the Old World tropics. Vanilla vines seem to flower but rarely, for they are seldom found in blossom in the Central American forests, nor does one often find the seed-pods.

WULLSCHLAEGELIA Reichenb. f.

Wullschlaegelia aphylla Reichenb. f. Plants terrestrial, saprophytic, leafless, with clustered fibrous roots, 30 cm. high or less; stems erect, puberulent, with numerous minute scales; flowers very small, white, forming a lax bracted spike 5–12 cm. long; petals oblong, less than 2 mm. long; lip on the upper side of the flower, sessile, broad, undivided.—Collected in wet forest; also in the West Indies and South America.

BURMANNIACEAE. Burmannia Family

GYMNOSIPHON Blume

Gymnosiphon tenellus (Benth.) Urban. A very slender and delicate, glabrous, whitish, saprophytic plant, without chlorophyll, the stems 12 cm. high or less, filiform, flexuous, usually solitary; leaves represented by minute scales; inflorescence usually bifid, few-flowered, the flowers subsessile, 5–8 mm. long; perianth tubular, the limb 6-lobed; ovary inferior; fruit a small capsule dehiscing by 3 longitudinal slits.—Occasional in wet dark forest, especially under corozo palms; ranging from Guatemala to Brazil. The plants are so small and slight that they are easily overlooked, unless one happens to be searching the ground carefully.

CASUARINACEAE. Beefwood Family

CASUARINA L.

Casuarina equisetifolia L. *Beefwood.* A tree somewhat resembling a pine in general appearance, with spreading whorled branches; leaves reduced to whorls of scales, the branchlets suggesting the stems of *Equisetum;* fruit a small cone 1–2 cm. in diameter.—Planted occasionally as a shade tree; native of tropical Africa and Asia. Called "pino de Australia" in Salvador and "sauce" in Nicaragua.

LACISTEMACEAE. Lacistema Family

LACISTEMA Sw.

Lacistema aggregatum (Berg) Rusby. *Plate XXX.* A glabrous tree 6–7.5 meters high; leaves alternate, short-petioled, oblong or elliptic-oblong, 8–15 cm. long, acuminate, acute at the base, entire or nearly so; flowers minute, arranged in very short and dense, bracted, clustered spikes in the axils of the leaves; fruit a small 3-valved capsule, red and somewhat fleshy at maturity, containing 1–3 seeds.—Common in thickets along streams or near the beach; widely distributed in tropical America. Although rather common, the tree is an inconspicuous one, and not likely to attract attention. Apparently no use is made of it in Central America unless it be for fuel.

PIPERACEAE. Pepper Family

The plants of the pepper family are herbs, shrubs, or small trees with mostly alternate and always entire leaves. They are easy to recognize by their flowers, which are small and green and arranged in very dense, slender spikes, which resemble catkins.

PEPEROMIA Ruiz & Pavón

Most of the Peperomias are epiphytic herbs, but a few of the Central American representatives are terrestrial. They have alternate, opposite, or whorled leaves which in most species are very thick and fleshy. The spikes are small, slender, and commonly green. The genus is a large one in Central America, most of the species being local in distribution.

Peperomia chucanebana Trel. A more or less matted, fleshy herb; leaves whorled in 4's, obovate, scarcely 1 cm. long, rounded at the tip, pale green; spikes pale green; stems often tinged with red.—Occasional on trees in forest.

Peperomia Gollii Trel. *Plate XXXI.* A coarse herb, erect or pendent, the stout stems often 30 cm. long; leaves alternate, long-stalked, obovate, obtuse or rounded at tip, tapering to the base, usually 8–10 cm. long; spikes green or pale green, long and slender; stems and peduncles often tinged with red.—Frequent on forest trees; known also from Guatemala. The leaves are very thick and hard. Of all tropical American plants known to the writer, Peperomias are the most difficult to dry, because of their succulent foliage which yields up its moisture only with the greatest reluctance, even under the influence of artificial heat.

Peperomia granulosa Trel. Stems slender, elongate; leaves alternate, lance-oblong, long-tapering, at base obtuse or acute, glabrous; spikes long and very slender, green or pale green.—On forest trees; known only from the region of Lancetilla.

Peperomia longeacuminata Trel. Similar to *P. granulosa*, but the leaves black-dotted and scarcely granular as in that species, the blades much thinner and less succulent.—Occasional on forest trees or spreading over mossy rocks.

Peperomia pellucida (L.) HBK. Terrestrial; a small erect fleshy branching herb rarely over 30 cm. high; leaves slender-stalked, usually rounded-ovate, about 3 cm. long, acute or obtuse, pale beneath; spikes pale green, short and very slender.—Frequent in wet thickets; widely distributed in tropical America. Called "hierba de sapo" in Panama.

Peperomia pililimba C. DC. Stems very slender, creeping, densely pilose; leaves alternate, slender-petioled, ovate to rounded, about 1 cm. long, obtuse or rounded at the apex, pilose on both surfaces; spikes short and slender, pale green.—On trees in wet forest; also in Guatemala.

Peperomia puteolifera Trel. Stems short or elongate and creeping, stout; leaves alternate, petioled, oblong to obovate, very thick and fleshy, glabrous, 3–6 cm. long, obtuse or rounded at the apex; spikes slender, pale green, 4–5 cm. long.—On trees or logs in wet forest.

Peperomia rotundifolia (L.) HBK. Stems very slender and creeping, forming dense mats; leaves slender-petioled, rounded, mostly 6–9 mm. long, glabrous, lens-shaped; spikes pale green.—Frequent on forest trees; widely distributed in tropical America.

Peperomia staminea Trel. Forming mats on tree branches, glabrous; leaves in whorls of 4, very thick and fleshy, elliptic or oblong-elliptic, obtuse, at base acute or obtuse, about 2.5 cm. long; stems often reddish; spikes short, long-stalked, bright green.—Frequent on trees in wet forest; known only from the vicinity of Lancetilla.

PIPER L.

The Pipers are shrubs or small trees, or more rarely herbs, which often form a large part of the undergrowth in dense forest or in thickets. A few species are weedlike in habit, and spring up in cleared areas. The leaves are alternate, and very variable as to size, shape,

and pubescence. The genus is one of the largest of Central America, but comparatively few species are known at present from Honduras. Many of them are much alike in general appearance, so that only a specialist can separate them. On this account they are noted here only very briefly.

Although the species are so numerous, and most of them so local in distribution, one familiar with the plants as they grow in the field can recognize them, except in a few of the most difficult groups, rather easily. The plants have little or no economic value. The usual name applied to them in Central America, and the one applied to all the Honduran species here listed, is "cordoncillo." In Panama the species sometimes are called "hinojo" and "gusanillo," the latter term, like "cordoncillo," referring to the long slender terete spikes.

Piper aeruginosibaccum Trel. A shrub 1.5–2 meters high with pale green spikes.—In moist thicket near La Ceiba, and probably in the Tela region; known only from the type collection.

Piper aspericaule Trel. *Cordoncillo* (the same name applied to all or most of the species here listed). A shrub 2.5 meters high, in a wooded swamp near Tela; known only from the type collection.

Piper atlantidanum Trel. A slender shrub 2–2.5 meters high, the large leaves rather softly pubescent.—Frequent in thickets and forest; known only from this region.

Piper atlantidanum Trel. var. **yoroense** Trel. Type collected in a wet thicket near Progreso.

Piper atrichopus Trel. A dense slender shrub 1.5–3 meters high.—Frequent on the forested hills above Lancetilla, and known only from this region.

Piper auritum HBK. *Matarro. Plate XXXII.* A shrub or small tree, sometimes 4.5 meters high, with few branches; leaves very large, often 40 cm. long or more, obtuse or rounded at apex, deeply cordate at base; spikes white or green, long and slender.—Common in wet thickets or forest; widely distributed in Mexico and Central America. The crushed leaves have an agreeable odor resembling that of sarsaparilla. It is said that in Honduras the young leaves are sometimes cooked and eaten. At Lancetilla this species is frequently a low tree, with definite trunk and crown.

Piper calvescens Trel. A dense glabrous shrub about 2 meters high; leaves 7-nerved from the broad base, short-stalked, with long

abrupt tips.—Common about Progreso and collected also at La Ceiba, but not noticed in the immediate vicinity of Tela.

Piper cobanense Trel. A shrub 1.5–2.5 meters high with rather large and broad leaves rounded at the base.—In wet thickets at Quebrada Seca; also in Guatemala.

Piper cobanense Trel. var. **sarculatum** Trel. Type collected at Quebrada Seca; a common weed in banana plantations.

Piper cyclophyllum Trel. A shrub about 2 meters high, with very large, rounded leaves, abruptly pointed at the tip and deeply cordate at the base.—Frequent in wet forest on the high hills above Lancetilla.

Piper dedititium Trel. A shrub 2.5 meters high with narrow leaves.—Type collected in a wet thicket at Quebrada Seca.

Piper fallens Trel. A shrub 1–2.5 meters high; easily recognized among the local species by its densely hirsute branches and leaves.—In wet forest above Lancetilla; known only from this region.

Piper fraguanum Trel. Type collected in low flat forest at La Fragua.

Piper gracillimum Trel. A shrub or tree 3–6 meters high with small narrow long-tapering leaves.—In wet forest high on the hills above Lancetilla.

Piper hispidiseptum Trel. A shrub 2–3 meters high with rather softly pubescent leaves.—In wet thickets and forest about Lancetilla, and confined to this locality, so far as known.

Piper imperspicuibracteum Trel. A shrub 1.5–2.5 meters high with narrow leaves and cream-colored or pale green spikes.—Known only from wet thickets in the vicinity of Tela.

Piper lancetillanum Trel. A slender shrub 1.5–2.5 meters high with narrow leaves and pale green spikes.—Known only from wet thickets about Lancetilla.

Piper laterifissum Trel. A coarse shrub or tree 3–4.5 meters high; leaves very large, deeply cordate at the base, the lower auricle longer than the petiole, densely and softly pubescent beneath.—In wet forest high on the hills about Lancetilla; known only from this region. The species is easily recognized by its large size and by the large leaves of characteristic form.

Piper levilimbum Trel. A shrub 2–3.5 meters high with rather broad, long-tipped, smooth leaves; spikes green.—Known only from thickets and forest of the Lancetilla region.

Piper multinervium Trel. A shrub 2–4.5 meters high, sometimes a small tree with a definite trunk; leaves narrow, pubescent beneath; spikes pale green, curved or hooked.—Common in wet thickets. This is one of the forms sometimes referred to *P. aduncum*.

Piper obsessum Trel. An inconspicuous shrub of 2 meters, with dull pale green spikes.—Type collected in a wet thicket near Lancetilla.

Piper onerosum Trel. A shrub 2–3 meters high, the narrow leaves softly pubescent beneath.—Frequent in swamps and thickets; known only from this region.

Piper peltatum L. *Ombligo*. A coarse herb about a meter high; leaves very large, rounded, cordate at the base, the petiole attached some distance above the base; spikes greenish white, clustered in umbels.—Common in wet fields or in forest; widely distributed in tropical America. Easily recognized by the herbaceous habit and very large, peltate leaves; conspicuously different in general appearance from the other species of the region. Called "Santa María" in Panama. It is reputed rather generally in Central America that the juice of this plant rubbed on the skin prevents the attacks of garrapatas or ticks, but I have never seen its efficacy tested.

Piper perinaequilongum Trel. A shrub or tree 2–6 meters high; leaves narrow, very unequal at the base.—Frequent in wet forest and thickets.

Piper perspicuibracteum Trel. A slender shrub 2 meters high with narrow leaves; spikes pale green, unusually long and slender.—Type collected in a thicket near Lancetilla.

Piper praeterlatum Trel. A shrub 1.5–3 meters high, the rather narrow leaves softly pubescent beneath.—Type collected in wet forest near Lancetilla.

Piper prodigum Trel. A slender shrub 2 meters high with narrow leaves which are very rough beneath; spikes pale green.—Type collected in a thicket near Lancetilla.

Piper quiriguanum Trel. A slender shrub 1.5–2.5 meters high; leaves slender-stalked, rounded-ovate, shallowly cordate at the base,

taper-pointed, 9-nerved from the base; spikes green, long and very slender.—In wet thickets near Progreso; also along the coast of Guatemala.

Piper scabriseptum Trel. A shrub 2–3 meters high with rather narrow leaves which are rough beneath.—Type collected in a thicket near Lancetilla.

Piper speratum Trel. A shrub 2.5 meters high with rather broad, rough leaves; spikes dull green or cream-colored.—Type collected in a wooded swamp near Tela.

Piper telanum Trel. A shrub a meter high; leaves very narrow, nearly glabrous.—Known only from the region of Tela.

Piper triumphale Trel. A shrub of 2–3 meters with rather narrow leaves; spikes pale green.—In thickets along the beach near Tela.

Piper tuberculatum Jacq. A shrub or tree 2–5.5 meters high, often very densely branched; leaves mostly oblong, very unequal at the base, obtuse or rounded at the tip; spikes green; trunk sometimes 25 cm. in diameter; leaves often shining.—Frequent about Tela, but scarce inland; widely distributed in Central America.

Piper Tuerckheimii C. DC. A shrub about a meter high with few branches; leaves mostly ovate, long-acuminate, peltate, the petiole attached just above the base of the blade.—Frequent in wet forest about Lancetilla; also in Guatemala. The species is a sharply marked one, easily recognized by its peltate leaves.

Piper vexans Trel. A shrub 2.5 meters high, the narrow leaves densely pubescent beneath and often roughened; spikes green.—Type collected in a thicket near Tela.

Piper Wilsonii Trel. A shrub 2 meters high, the small broad leaves nearly glabrous, 5-nerved from the base.—Known only from thickets in the vicinity of Tela.

Piper yoroanum Trel. A shrub 2 meters high with narrow, very rough leaves; spikes pale green.—Type collected in a wet thicket near Quebrada Seca.

Piper yzabalanum Trel. var. **pubinerve** Trel. A stout shrub 1.5–2 meters high with rather large, nearly glabrous, oval or broadly elliptic leaves; spikes pale green.—In thickets about Tela and Lancetilla; the typical form of the species grows in Guatemala.

SALICACEAE. Willow Family

SALIX L.

Salix chilensis Molina. *Sauce. Willow.* A tree 9–18 meters high with slender drooping branches and linear alternate leaves; flowers in slender catkins; fruit a small capsule, the seeds with tufts of white "cotton."—Common along streams and apparently indigenous here; widely distributed in tropical America. This is the only willow known from Central America south of Guatemala, and it extends southward over the greater part of South America. About Lancetilla the tree is plentiful along all the larger streams, where it is conspicuous because of the color of its foliage, of a much lighter green than that of most of the accompanying trees.

MYRICACEAE. Bayberry Family

MYRICA L.

Myrica cerifera L. *Bayberry.* A shrub or small tree 2–4.5 meters high; leaves narrowly oblong or oblanceolate, mostly 4–6 cm. long, obtuse, tapering to the base, irregularly and inconspicuously toothed, alternate, without stipules, copiously furnished beneath with minute yellow resin glands; flowers minute, dioecious, in short dense spikes in the leaf axils; fruit a small globose nutlet covered with whitish wax.—Frequent in thickets along the beach near Tela; also in Yucatan, and widely distributed in the West Indies and in the United States. This rather inconspicuous shrub seems to be unknown to the native people about Tela, but in the United States the fruits are gathered in quantity in some localities, boiled in water so as to separate the wax, and this is skimmed off and cooled. The wax is made into candles, which have a characteristic greenish color and burn with a peculiar agreeable fragrance.

In the mountains of Honduras occurs another species, *Myrica mexicana* Willd., known there as "cera vegetal" (vegetable wax). This species is widely distributed in the mountains of Central America and Mexico, and in certain regions is used in the same manner as *M. cerifera* in the United States.

ULMACEAE. Elm Family

The local representatives of the elm family are trees or shrubs with alternate 3-nerved leaves and watery sap. The stipules are small and inconspicuous. The small greenish flowers have a calyx with 4–5 lobes or sepals and no petals. The fruit is a small drupe.

The true elms, of the genus *Ulmus*, are not represented in Central America, but there grows in the mountains of the interior of Honduras a closely related tree, *Chaetoptelea mexicana* Liebm., which is sometimes referred to the genus *Ulmus*.

CELTIS L.

Celtis Hottlei Standl. *Manteca.* A tree 18 meters high with a trunk 55 cm. in diameter, unarmed; leaves short-petioled, entire, glabrous, long-acuminate, acute at the base.—Described from specimens collected near Progreso; occurring also in British Honduras.

Celtis iguanaea (Jacq.) Sarg. A slender shrub, the branches 3–6 meters long, arching or often clambering over trees and shrubs, armed with stout recurved spines; leaves short-petioled, ovate-oblong to oval, rounded or short-acuminate at the apex, obscurely serrate, nearly glabrous; flowers small, green, in axillary cymes; fruit a yellow or orange drupe 8–12 mm. long.—Occasional in wet thickets; widely distributed in tropical America. Called "cagalera" in some parts of Central America. This plant is very unlike the *Celtis* species (hackberries or sugarberries) of the United States as regards its general appearance.

TREMA Lour.

Trema micrantha (L.) Blume. *Capulín.* A tree 6–9 meters high, unarmed; leaves short-petioled, ovate to lance-oblong, gradually long-acuminate, finely serrate or nearly entire, rounded and often oblique at the base, pubescent or nearly glabrous; flowers minute, greenish white, in axillary cymes; drupes red, about 2 mm. long.—Common about Progreso, and occasional in the region of Lancetilla; widely distributed in tropical America. The name "capulín negro" is reported from Honduras. In Salvador known as "capulín macho," "capulín montés," "capulincillo," and "churrusco"; in Costa Rica sometimes called "jucó" and "vara blanca." The bark contains a strong tough fiber. The wood is of light weight, soft, close-grained, and light brown.

MORACEAE. Mulberry Family

The trees belonging to this family are very diverse as to habit and other characters, but most of them have milky sap, and alternate leaves which often are provided with large, mostly deciduous stipules. The only genus with herbaceous species is *Dorstenia*. The flowers are usually very small or almost microscopic, but frequently they are

arranged in conspicuous inflorescences. They have no petals, and are often arranged in heads, spikes, or racemes.

ARTOCARPUS Forst.

Artocarpus communis Forst. *Palo de pan, Mazapán. Breadfruit.* A handsome large tree with very dense, rounded crown and deeply lobed leaves, native of the East Indies and the Pacific Islands. It is planted plentifully here, as it is everywhere along the Atlantic coast of Central America. The tree is most common in those localities where there is a large West Indian population. In the interior it is sometimes grown as a shade tree, to which purpose it is eminently adapted. The young and tender fruits are cooked and eaten in the regions where the tree is grown. The breadnut, a form of this species with large edible seeds, is planted at Puerto Arturo.

BROSIMUM Sw.

Large trees with milky sap; leaves short-petioled, thick and entire, glabrous or nearly so, the stipules small and soon falling; flowers of the two sexes densely crowded into small globular heads. Fertile flower only one in each head, developing into a globose fruit with fleshy pulp.

Several other species grow in Central America. One of them, *B. utile* (HBK.) Pittier, is the famous cow tree of Venezuela, which reaches Panama and probably Costa Rica. The milky sap is said to be a nourishing food, and is drunk like cow's milk in some regions.

Brosimum costaricanum Liebm. *Masicarán, Masicarón.* I was given also the name "masica" for this tree, but probably in error. A tall forest tree; leaves short-petioled, glabrous, elliptic-oblong to lance-oblong, mostly 8–15 cm. long, cuspidate-acuminate, with usually about 10 pairs of lateral nerves; flower heads nearly sessile, solitary or in pairs; fruit reddish or yellowish, 1–1.5 cm. in diameter.—Common in wet forest; ranging to Costa Rica, where it is called "ojoche." In Costa Rica the seeds are sometimes boiled and eaten, and the fallen flower heads also are said to be edible.

Brosimum terrabanum Pittier. *Masica.* A very large tree, similar to the preceding; leaves glabrous or nearly so, oblong-elliptic, caudate-acuminate, thick, usually with more numerous lateral nerves than in *B. costaricanum* and rather broader, short-petioled; fruits 1.5 cm. in diameter, yellowish.—Probably the most abundant tree of the region, plentiful nearly everywhere but especially on the hills;

ranging from Guatemala to Costa Rica. Called "ojoche" in Costa Rica. The wood is used locally chiefly for charcoal, but also sometimes for lumber. The seeds are boiled and eaten in the Tela region, and they are sometimes made into a kind of tortilla. The name "breadnut" is given to this tree by the English-speaking people of Central America.

CASTILLA Cerv.

Castilla elastica Cerv. *Ule, Hule. Mexican rubber tree.* A tree of medium size, the sap milky; leaves deciduous, nearly sessile, oblong, usually 20–45 cm. long, abruptly pointed, densely hairy, entire or nearly so, cordate at the base; flowers of two sexes in separate heads on the same tree, densely crowded on a flat or somewhat cup-shaped receptacle which is surrounded by overlapping scales; fertile receptacles in fruit often over 5 cm. broad, orange-red, bearing numerous fleshy fruits.—Frequent at low altitudes, in wet forest or thickets; ranging to Salvador and Mexico. Bark smooth and gray; wood light brown, fairly soft, not strong, perishable, not used.

Several other species of this genus occur in Central America. They vary greatly as to the quality of the rubber which they yield, and some are practically useless as a source of rubber. Most of the larger trees seen in Honduras bear the large oblique scars indicating that they have been tapped for their rubber, which is obtained by coagulating the milky sap. The Castillas have yielded large amounts of rubber for export, and they have been cultivated upon a small scale, but their cultivation does not succeed in competition with the cheaper rubber produced by the *Hevea* trees grown in the East Indies. The aboriginal inhabitants of Central America and Mexico were well acquainted with the rubber produced by these trees, and they employed it for waterproofing clothing, shoes, and hats, for making bottles, and for fashioning large balls used in certain games. The *Castilla* trees are easy to recognize, even at a distance, because of their large narrow leaves, which are arranged in two rows on the branches and often droop abruptly. The brightly colored fruit heads also make the trees conspicuous at certain seasons of the year.

CECROPIA L.

Cecropia hondurensis Standl. *Guarumo. Trumpet-tree.* A tree 4.5–15 meters high, with few spreading branches; trunk smooth, whitish; leaves clustered near the ends of the few branches, long-stalked, very large, deeply lobed, white beneath; flowers of the two

sexes borne on separate trees, arranged in long slender spikes which are arranged in umbels at the end of a stout stalk, the whole inflorescence at first enclosed in a large bract; fruiting spikes gray-green, 10 cm. long, somewhat fleshy.—Abundant in the lowlands and also occurring in the forest; known only from this region. It is probable that one or more additional species may occur here.

The Cecropias, of which there are several species, are among the most abundant and characteristic trees of the Central American coastal regions, and they sometimes extend far up into the mountains. They are of very distinctive appearance because of their peculiar habit and coloring, and stand out conspicuously among all other trees. They are often provided with prop roots, like those of Indian corn. They grow most abundantly upon cut-over land, and spring up everywhere as weeds as soon as land is abandoned. In virgin forest they are comparatively rare, but they do grow in primeval woodlands. The hollow trunks are always inhabited by small ants which bite ferociously and protect the tree well against man and probably other animals. It has been supposed that these ants protect the trees also against other insects, but it has been found recently that this is not the case.

The wood of the Cecropias is soft and useless. The bark contains a tough fiber which has been employed by some Central American Indians for making rope, mats, and coarse cloth. The sap is reported to contain small amounts of rubber. The trunks are sometimes split and used for troughs, and the hollow stems are recorded as having been used by the aborigines for fashioning trumpets, hence the English name. The name used universally in Central America for these trees is "guarumo," a word of West Indian origin.

CHLOROPHORA Gaud.

Chlorophora tinctoria (L.) Gaud. *Mora. Fustic.* A small or medium-sized tree, somewhat resembling the osage orange (*Maclura pomifera*) of the United States, and closely related to it; bark brownish gray, containing milky juice; branches often armed with spines; leaves bright green, thin, oblong to ovate, taper-pointed, coarsely toothed or often lobed on young shoots, nearly glabrous; flowers of the two sexes on separate trees, the staminate in long catkins, the pistillate in dense heads; fruits globular, green, 1 cm. in diameter, containing numerous seeds.—In thickets about Progreso; not noticed near Tela; widely distributed in tropical America. The name "mora" is current through most of Central America. The tree is of impor-

tance as the source of fustic dyewood, employed for brown, yellow, and green dyes, and especially for the olive-drab of khaki. Large amounts of it have been exported from Central America. It is light yellow, close-grained, strong and tough, rather heavy, and takes a high polish. It is utilized for furniture, interior finish, cart wheels, and many other purposes, and the bitter bark is used in tanning.

COUSSAPOA Aubl.

Coussapoa panamensis Pittier. *Matapalo.* A tree 8–12 meters high or larger, with smooth pale bark and rounded crown; leaves long-stalked, broadly ovate, rounded and usually short-pointed at the apex, rounded or shallowly cordate at the base, thick, entire or nearly so, often densely whitish-pubescent beneath or felted; flowers minute, arranged in dense globose heads 1 cm. or more in diameter, the heads borne on short stalks inserted in the leaf axils, becoming fleshy at maturity.—Common in forests and often seen in pastures; ranging to Panama. The several species of *Coussapoa* found in Central America are much like the figs in habit, the seeds germinating upon the branches of trees. They often persist for a long time upon their host, but ultimately they stand alone. The bark is smooth and gray; the wood reddish, moderately hard, and heavy, rather coarse-textured, not very durable, and probably seldom if ever utilized.

DORSTENIA L.

Dorstenia choconiana Wats. var. **integrifolia** Donn. Smith. An erect simple-stemmed herb about 30 cm. high with long root-stock; leaves long-stalked, oblong or lance-oblong, about 17 cm. long, taper-pointed, entire or nearly so, slightly pubescent; flowers minute, green, arranged on the inner surface of a stalked receptacle shaped like a wine glass, green, and 1.5 cm. broad.—Frequent in deep forest on the hills above Lancetilla; ranging from Guatemala to Costa Rica. The typical form of the species has deeply lobed leaves.

FICUS L. Figs

This genus of trees is represented in Central America by about 35 species of trees, which are easily recognized by their general appearance, especially by their milky sap, smooth pale trunks and branches, and the characteristic fruits, much like those of the cultivated fig of the Old World, but smaller. The fruits are globular, and consist of a fleshy receptacle which has at the apex a minute opening covered by a few overlapping scales, the minute flowers

being crowded over the inside of the receptacle. It is evident that fertilization must be a difficult process, and it is interesting to know that it is performed by special tiny insects which inhabit the fruits. It is said that there is a separate species of insect for each species of *Ficus*.

The wild figs are of interest because of their "strangling" habit, which gives rise to the common Spanish name, "matapalo," "tree-killer." The fruits are much eaten by birds, and they transport the microscopic seeds to the branches of trees, where they germinate. As the plant develops it attaches itself to the host tree by small rootlets, then sends out long cordlike roots which sometimes dangle like ropes from the branches, or run along the trunk of the host, finally reaching and rooting in the soil. The stems then enlarge, often are flattened, and soon envelop the host trunk in a network of stems or trunks. The host is sometimes able to withstand this attack for many years, and one may often see the top of some lofty tree projecting above the top of a large fig tree. Ultimately, if the fig tree thrives, the host is killed, and the fig tree stands alone.

The wood of these trees is soft and perishable, and seldom or never used. On this account the trees often are left when clearings are made. They are favorite shade trees because of their handsome, broad, and very dense crowns and vigorous foliage. The fruits of some species are eaten, being sweet but rather insipid.

From the bark of the fig trees the ancient Mexicans prepared the paper upon which some of their manuscripts were written. The sap is very sticky and contains small amounts of rubber. *Ficus elastica*, the familiar rubber tree of city flats, is an East Indian species which yields rubber in substantial amounts and of good quality. The Old World fig, *Ficus Carica* L., thrives in the interior of Honduras, but it is little grown there.

The Central American wild figs fall naturally into two groups:

A. Receptacles (fruits) solitary in the leaf axils; involucre at base of the receptacle 3-lobed; leaves often scabrous, rough.

Ficus crassiuscula Warb. *Higuero.* A large tree with broad thin buttresses; leaves long-petioled, elliptic or oval, mostly 15–20 cm. long, obtuse, rounded at the base, glabrous, with numerous pairs of slender lateral veins; stipules 4–6 cm. long; fruits 1.5–2 cm. thick. —Common in the forests; extending to Panama, where this species is planted as a shade tree in the Canal Zone.

Ficus glabrata HBK. *Higuero, Matapalo.* A tree 12–15 meters high or larger, with a broad open crown; leaves elliptic-oblong or nearly elliptic, usually not more than 2.5 times as long as broad, gradually narrowed to the acute tip, glabrous, with slender veins; fruits large, 1.5–4 cm. in diameter or even larger, sweet, edible.—Common in forests, thickets, and pastures; widely distributed in tropical America. Called "amate" in some parts of Honduras, the word derived from the old Aztec name for the fig trees, the same as the word for paper. Wood gray or brownish, light, coarse-textured, perishable, not used. The names "chilamate" and "chilamatón" are applied to this species in Salvador. The fruits are the largest produced by any of the Honduran species, and they are more nearly edible than those of any other wild fig.

This is one of the handsomest of all the fig trees. As is the case with other species, the trunk and limbs are nearly always clean and perfectly free from epiphytes, which for some reason do not frequent fig trees.

Ficus radula Willd. *Higo, Higuero.* A large tree; leaves elliptic-oblong, rough beneath, rounded or obtuse at the tip and abruptly short-pointed; stipules 1–1.5 cm. long; fruits 1.5–3 cm. in diameter.—Common about Tela in swampy woods; ranging from Mexico to South America. Called "higuerón" and "higuerón blanco" in Costa Rica; "amate" and "salamate" in Salvador.

Ficus segoviae Miq. *Higo, Higuero.* A large or small tree, similar to *F. glabrata,* of which it is probably only a form; leaves much narrower than in that species, usually 4 times as long as broad or longer; fruits 1.5–3 cm. in diameter; leaves smooth.—Common in forest and along streams; ranging to Nicaragua and Mexico.

Ficus Tonduzii Standl. *Higuero.* A large tree; leaves mostly oval-obovate, large, rounded at the tip and sometimes abruptly short-pointed, thick, smooth, the lateral nerves few, very coarse and far apart; fruits sessile, 2–3 cm. in diameter.—Common in the forests, extending to Panama.

B. Receptacles in pairs in the leaf axils; involucre 2-lobed; leaves never scabrous but often pubescent.

Ficus Colubrinae Standl. A tree about 12 meters high, the branchlets usually hairy; leaves mostly elliptic or obovate-elliptic and 5–9 cm. long, acuminate, rounded or obtuse at the base; fruits

about 6 mm. in diameter, sessile.—In wet forest; distributed from Guatemala to Costa Rica.

Ficus Hemsleyana Standl. *Higuero, Matapalo.* A large tree; leaves long-petioled, oblong, 10–20 cm. long or larger, abruptly narrow-acuminate, glabrous, rounded at the base; fruits stalked, 8–10 mm. in diameter.—In wet forest; Guatemala to Panama. Called "amate" in Salvador and "higuerón" in Costa Rica.

Ficus involuta (Liebm.) Miq. *Higo, Matapalo.* A large tree; leaves short-petioled, obovate-oblong, 10–20 cm. long, rounded at the apex, long-tapering to the base, glabrous or nearly so; fruits nearly sessile, 1.5–2 cm. in diameter.—Frequent in forests, often along streams; extending to Panama and Mexico. Called "amate" and "capulamate" in Salvador, and the name "palo de agua" is recorded from Costa Rica, but perhaps erroneously. This species is easy to recognize by the wedge-shaped leaves with rounded or rarely acutish apex.

Ficus Kellermanii Standl. *Higuero, Matapalo, Higuillo.* A large tree with broad dense crown; branchlets often coarsely hairy; leaves oblong to obovate or oval, 8–15 cm. long or larger, rounded to acutish at the apex, obtuse to subcordate at the base, hairy or nearly glabrous beneath; fruits sessile, 8–10 mm. in diameter.—About Tela and Progreso; also in Salvador, Guatemala, and Mexico. Called "amate" in Salvador and "capulín amate" in Guatemala.

Ficus Oerstediana Miq. *Higuillo.* A tree 6–15 meters high, sometimes only an epiphytic shrub; leaves short-petioled, glabrous, obovate, acute, mostly 6–10 cm. long, long-tapering to the base; fruits stalked, only 5–6 mm. in diameter.—Frequent in thickets and pastures about Tela; extending from Guatemala to Panama and northern South America. This has the smallest fruits of all the Central American figs.

Ficus padifolia HBK. *Higuillo.* A tree 6–9 meters high or larger, often fruiting when only a shrub; leaves mostly lanceolate or elliptic-oblong, 6–12 cm. long or sometimes larger, acute or acuminate, glabrous; fruits stalked, 9–12 mm. in diameter.—Common in forests and thickets; one of the commonest species of Central America and Mexico. Called "higuito" in Costa Rica, and in Salvador "capulamate," "amate," "amatillo," "chilamate," and "cushamate." This is one of the handsomest of all the figs, and often attains a great size. In Salvador the leaves are given as fodder to mules, and it is reported that the animals become fat when feeding upon them.

Ficus panamensis Standl. *Higuero.* A large tree; leaves short-petioled, oblong or obovate-oblong, usually 10–18 cm. long, glabrous or nearly so, abruptly acuminate, obtuse at the base; fruits sessile, 1 cm. in diameter.—Occasional; distributed from Mexico to Colombia.

Ficus Popenoei Standl. *Higuillo.* A medium-sized tree with densely hairy branchlets; leaves short-petioled, obovate or oval, mostly 8–12 cm. long, rounded at the apex, rounded or subcordate at the base, rough and densely hairy; fruits short-stalked, obovoid, 1.5 cm. long, densely hairy.—In forest on the hills above Lancetilla; known only from this locality.

Ficus sp. *Higuillo.* A tree 6–15 meters high; leaves long-stalked, broadly ovate or rounded, large, obtuse to rounded at the apex, subcordate at the base, glabrous.—A form frequent about Tela, but I was unable to find fruiting specimens. The species is apparently not described.

NAUCLEOPSIS Miq.

Naucleopsis naga Pittier. *Concha de indio, Majao de indio.* A tree 9 meters high or larger; leaves short-petioled, in two ranks along the branches, oblanceolate-oblong, 20–45 cm. long and 6–12 cm. wide, acuminate, obtuse at the base, glabrous, leathery; staminate inflorescences solitary in the leaf axils, sessile, 4 cm. broad, covered with scalelike bracts; fruiting receptacle woody, the inner bracts hard and woody, spinelike.—A frequent tree of the forests about Lancetilla; also in Costa Rica, where it is known by the name "naga." It is stated that the bark is employed by some of the less civilized Indians of Honduras for making mats and other articles.

POUROUMA Aubl.

Pourouma aspera Trécul. *Guarumo de montaña.* A large forest tree, in general appearance much like the Cecropias; leaves long-stalked, very large, deeply lobed, white beneath, the petiole inserted at the base of the leaf and not above the base (peltate) as in *Cecropia;* flowers in loose many-flowered cymes.—Frequent on the forested hillsides; ranging from Guatemala to South America. The ripe fruits, which are about 1.5 cm. long and ovoid, are reported to be eaten by some of the Indians of Costa Rica.

TROPHIS L.

Trees, unarmed, the leaves entire or toothed; flowers of two sexes on separate trees, the staminate ones in long catkins, the pistillate in

spikes or racemes; fruit a small drupe containing a single seed, surrounded by scant flesh.

Trophis chorizantha Standl. A tree 9 meters high with slender branchlets; leaves oblong or obovate-oblong, abruptly long-pointed, obtuse or acute at the base, about 12 cm. long, nearly entire, glabrous, smooth to the touch; pistillate flowers in long, slender, much interrupted spikes.—In forest high on the hills above Lancetilla; known only from this locality.

Trophis racemosa (L.) Urban. *San Ramón.* A tree 6–9 meters high; leaves oblong to oval or obovate, entire or serrate, very rough beneath; fruiting spikes short and densely flowered.—Frequent about Tela and Progreso, in thickets; widely distributed in tropical America. Called "raspa-lengua" in Salvador, and the usual name in Central America is "ramón." My informant at Tela insisted that the name was "San Ramón," the temptation to attach the "San" evidently being too great to be resisted. In some parts of tropical America, especially in Cuba, the leaves of this tree are fed to stock, especially to horses, and they are said to be very nutritious. The fruits are edible, but the flesh is so scant that they are scarcely worth the trouble of eating them.

URTICACEAE. Nettle Family

These plants are herbs, shrubs, or small trees, frequently armed with stinging hairs. The alternate or opposite, entire or toothed leaves sometimes are very unequal, and they are often sprinkled with pale, linear or dotlike cystoliths. The small greenish flowers are usually unisexual, without petals, the perianth represented by a calyx of 2–5 lobes or sepals, or sometimes absent. The stamens are 2–5, and the fruit is small, 1-seeded, and either dry or fleshy.

The true nettles of the genus *Urtica* grow in the mountains of Central America.

BOEHMERIA Jacq.

Boehmeria cylindrica (L.) Sw. An inconspicuous erect herb a meter high or less, nearly glabrous; leaves opposite and alternate, on long slender petioles, ovate, long-acuminate, coarsely toothed, 3-nerved; flowers in small dense clusters in the leaf axils, or forming long, nearly naked spikes; fruit minute and dry.—Frequent in wet thickets; widely distributed in tropical America.

MYRIOCARPA Benth.

Myriocarpa yzabalensis (Donn. Smith) Killip. *Plate XXXIII.* A shrub or small tree 3–6 meters high, with few branches, the branches

hirsute or hispid; leaves very large, broadly ovate to oblong-elliptic, acute, rounded at the base, finely blunt-toothed, harshly pubescent; flowers minute, in threadlike white spikes often 30–60 cm. long or more; fruit a minute achene.—Common in wet forest and thickets; ranging to Panama and Guatemala. Called "chichicastillo" at Cuyamel. Easily recognized by the very long and slender flower spikes, which dangle like threads from the stiff branches.

PILEA Lindl.

This genus is a rather large one in Central America, especially in the mountains of Costa Rica and Panama, but the plants are inconspicuous and of little general interest. They are succulent herbs with opposite leaves, the small greenish flowers arranged in cymes or dense clusters in the leaf axils. The two sexes of the flowers are borne upon the same or upon different plants. The fruit is a small compressed achene.

Pilea herniarioides (Sw.) Lindl. A very small, succulent herb with filiform stems, erect or creeping; leaves rounded, minute, only 1–3 mm. long, entire, glabrous or nearly so.—Found only underneath the laborers' quarters at Lancetilla, growing in moist soil; probably introduced from the West Indies, but recorded from a few stations in Central America.

Pilea hyalina Fenzl. A succulent erect branched herb 30–50 cm. high, glabrous; leaves long-petioled, broadly ovate, 1–6 cm. long, coarsely crenate; flower clusters loose, usually shorter than the petioles.—In wet thickets and forest about Quebrada Seca and La Fragua; ranging to Mexico and South America. Called "hierba de masamorra" in Salvador.

Pilea microphylla (L.) Liebm. A small succulent annual, usually erect, with rather stout stems, glabrous; leaves mostly obovate and 2–5 mm. long, entire; flower clusters minute, shorter than the leaves.—A weed in garden at Lancetilla, apparently introduced; widely distributed in tropical America, in Central America often growing on old masonry. Called "palma del norte" in Salvador. This plant and related species are sometimes grown for ornament in the hothouses of the North, under the name "artillery plant." This term is applied because of the fact that when the flowers are touched the anthers eject the pollen with considerable violence, throwing it to a distance.

Pilea serpyllacea (HBK.) Liebm. *Mariposa.* Similar to *P. microphylla,* but the leaves larger, about 1 cm. long.—Cultivated for ornament. Called "lace plant" in the Canal Zone.

POUZOLZIA Gaud.

The local species are unattractive shrubs with conspicuous thin stipules and with petioled entire leaves. The small greenish flowers are densely clustered in the leaf axils.

Pouzolzia obliqua Gaud. A shrub or small tree 1.5–6 meters high, copiously pubescent; petioles usually less than 1 cm. long; leaf blades oblong, long-acuminate, very oblique at the base and 3-nerved.—Frequent in wet thickets; ranging to Guatemala and Peru.

Pouzolzia occidentalis Wedd. A shrub or tree 2.5–4.5 meters high; leaves long-petioled, oblong to broadly ovate, densely pubescent and rough, long-acuminate, almost equally rounded at the base, thin.—In wet thickets about Progreso; ranging to the West Indies and southward to Venezuela.

URERA Gaud.

The Ureras are shrubs or small trees, usually armed with stinging hairs, the leaves alternate, long-petioled, and variously toothed. The usually dioecious, small, greenish flowers are disposed in cymes or panicles in the axils of the leaves. The achene in fruit is surrounded by the fleshy enlarged calyx, the whole resembling a fleshy juicy fruit.

Urera alceaefolia Gaud. A shrub or small tree 3–4.5 meters high, only slightly stinging; leaves slender-petioled, oblong to elliptic, small or large, coarsely but closely dentate, hairy, the pale cystoliths oblong, radiating from the hairs; flowers in short lax cymes, the small fruits bright red.—Frequent in wet thickets; ranging to Mexico and Panama. The shrub is a showy one because of the abundant clusters of brightly colored fruits.

Urera baccifera (L.) Gaud. *Chichicaste. Plate XXXIV.* A shrub 1.5–2.5 meters high, or sometimes a small tree, the stems thickly armed with large coarse pricklelike hairs; leaves long-stalked, oval to broadly ovate, large, densely hairy, especially beneath, with few large coarse teeth; rachis of the inflorescence dull red; fruit white, with watery juice.—Occasional in thickets; widely distributed in

tropical America. Called "ortiga" in Panama; "nigua" or "nigüilla" in Salvador, the names referring to the fruits, which suggest a nest of the chigger or *nigua*. The usual name through most of Central America is "chichicaste." The hairs sting very painfully upon the slightest contact with the skin, and the plant is one of the worst pests of tropical jungles. Violent contact with the hairs gives almost the effect of an electric shock, the resulting pain and irritation sometimes lasting for several days. The shrub is often planted for hedges in Central America, and certainly forms an effective barrier against man and most of the larger animals.

Urera caracasana (Jacq.) Griseb. *Chichicaste.* A shrub or small tree 3–6 meters high, stinging but slightly; leaves large, broadly ovate, cordate at the base, closely crenate, sparsely or densely pubescent, long-stalked; fruits small, orange-red.—Frequent in wet thickets; widely dispersed in tropical America. Sometimes called "ortiga" in Panama. This species, also, is very showy when in fruit.

Urera elata (Sw.) Griseb. *Chichicaste.* A tree 7.5 meters high, armed with stinging hairs; leaves very large, ovate or ovate-oblong, rounded at the base, closely and regularly toothed, the cystoliths dotlike; fruits orange-red.—Occasional in wet mountain forest; distributed from Guatemala to Panama, and in Jamaica.

PROTEACEAE. Protea Family

GREVILLEA R. Br.

Grevillea robusta Cunn. *Silk-oak.* A medium-sized tree; leaves pinnate, the leaflets deeply lobed, silky beneath; flowers showy, orange, in large dense racemes.—Planted for ornament; native of Australia. Although a rather unattractive tree, this is planted very commonly in most parts of Central America in parks and along streets.

LORANTHACEAE. Mistletoe Family

The plants of this family, of which there are a large number in Central America, are true parasites; that is, they grow upon the branches of trees or shrubs to which they are united organically, and draw all their sustenance from them. They have woody stems and opposite thick fleshy entire leaves. The flowers are small or large, with a simple perianth, no corolla being present although the perianth often is colored so as to resemble a corolla. The fruit is a small, often transparent berry with very sticky pulp.

ORYCTANTHUS Eichl.

Oryctanthus cordifolius (Presl) Eichl. *Suelda con suelda.* A shrub, its branches usually 30–60 cm. long; leaves ovate, sessile, mostly subcordate at the base and clasping the branch, narrowed to the obtuse apex; flowers sunken in depressions in the rachis of the spike, very small, green.—Common; growing on *Croton, Lacistema,* and other shrubs and trees; ranging from Guatemala to Panama, and perhaps still farther southward. The young branches are somewhat compressed and 2-edged. Called "hierba del pájaro" in Salvador.

PHORADENDRON Nutt. Mistletoe

The Central American plants of this genus are much like the familiar mistletoe of the United States, which itself is rather different from the classical mistletoe of Europe. They are coarse parasitic shrubs with thick heavy leaves, the small and inconspicuous flowers in short dense spikes, but not sunken in the rachis as in *Oryctanthus.*

Phoradendron piperoides (HBK.) Trel. *Suelda con suelda.* Branches often a meter long and frequently pendent in dense masses from tree limbs; leaves mostly elliptic or ovate and 6–9 cm. long, acute at base and apex, glabrous; flower spikes green or greenish yellow.—Frequent; widely distributed in tropical America. Called "liga" in Guatemala, and "matapalo" in Salvador.

Phoradendron robustissimum Eichl. *Suelda con suelda.* A dense shrub forming large masses on trees; leaves oblong or broadly oblong, very thick, rounded at the apex, acute or obtuse at the base, short-petioled; flower spikes green.—Near Tela; ranging to Guatemala and Costa Rica.

PHTHIRUSA Mart.

Phthirusa pyrifolia (HBK.) Eichl. *Suelda con suelda.* A shrub, its branches usually 30–90 cm. long, often pendent in dense tangles from tree limbs; leaves slender-petioled, mostly oblong and rather thin, obtuse or contracted at the base, at the apex rounded and abruptly sharp-tipped; flowers green, in rather long and interrupted spikes, the rachis brown-scurfy.—Common; growing on *Saurauia, Acalypha diversifolia, Piper tuberculatum,* and other shrubs and trees; ranging from Guatemala to South America. Called "matapalo" in Salvador.

PSITTACANTHUS Mart.

Psittacanthus calyculatus (DC.) Don. *Suelda con suelda, Gallinazgo.* A glabrous shrub, forming dense masses usually on the tallest trees; branches angled; leaves short-petioled, lanceolate or narrowly ovate, 6–15 cm. long, often very oblique, attenuate to the apex, obtuse or rounded at the base; flowers 3–5 cm. long, in loose corymbs, scarlet or orange-red; berries 1–1.5 cm. long, orange-red.—Frequent on forest trees; distributed from Mexico to Costa Rica. Called "matapalo" and "liga" in Salvador. The plants are very handsome and showy when in flower, and are usually mistaken for the flowers of some gaudy forest tree.

OLACACEAE. Olax Family

The members of the family are shrubs or trees with alternate entire leaves without stipules. The small or medium-sized flowers, borne singly or in clusters in the leaf axils, have a 4–6-toothed or 4–6-parted calyx, a corolla with 4–6 lobes or petals, and twice as many stamens as corolla segments. The fruit is a drupe.

HEISTERIA Jacq.

Heisteria macrophylla Oerst. A glabrous shrub or small tree; leaves oblong-elliptic, mostly 9–20 cm. long and 4–6 cm. wide, short-stalked, short-acuminate, acute at the base, somewhat leathery; flowers slender-stalked, with 5 or 6 petals, the calyx small at first but in fruit much enlarged, saucer-shaped, and colored purple-red; fruit a black drupe.—In wet forest near Lancetilla; ranging to Panama. Called "ajicillo" in Panama and "sombrerito" and "cresta de gallo" in Salvador. The Honduras specimens are sterile, and their specific determination therefore somewhat uncertain.

XIMENIA L.

Ximenia americana L. *Cagalera. Tallow-wood.* A glabrous shrub 3–4.5 meters high, armed with stout spines; leaves oblong to elliptic, 3–7 cm. long, short-stalked, rounded or obtuse at the apex, entire; flowers small, yellowish white, fragrant, borne in small cymes in the leaf axils; corolla 4-lobed, densely hairy within; fruit a yellow plumlike drupe 1.5 cm. long with acid edible flesh.—In thickets along the beach near Tela; widely distributed in tropical America, and extending northward to Florida. Called "pepenance" and "manzanillo" in Salvador, and "chochomico" in Nicaragua. The name

"manzanilla" is reported from Honduras and Guatemala. The dark red, astringent bark may be used for tanning. The wood is fragrant, reddish yellow, fine-textured, and very hard and heavy. It is ordinarily too small to be useful, but it is reported to have been employed as a substitute for sandalwood.

OPILIACEAE. Opilia Family

AGONANDRA Miers

Agonandra racemosa (DC.) Standl. A tree about 9 meters high with a trunk 25 cm. in diameter at the base; bark pale, slightly corky, broken into small square scales; leaves lanceolate, acute or acuminate, acute or obtuse at the base, glabrous, entire, alternate, with small stipules; flowers dioecious, small and greenish, in bracted axillary racemes; fruit a small drupe.—In wet forest on the hills above Lancetilla; the species ranges from Salvador to Mexico. The Honduran specimens are sterile, and their determination doubtful, but from the leaves alone I believe that the tree belongs to this genus. The tree, as it grows in Honduras, is a very curious one because of its habit. The trunk tapers gradually from its broad base to a very slender, whiplike top. The crown is composed of only a few short and straggling branches.

BALANOPHORACEAE. Balanophora Family

HELOSIS L. Rich.

Helosis mexicana Liebm. A fleshy herb without chlorophyll, resembling a mushroom, parasitic upon the roots of other plants, glabrous or nearly so; stem leafless, 6–20 cm. long; flowers very small and numerous, crowded in a dense ovoid head, this 1.5–4.5 cm. long, rounded at the apex, covered with small peltate bracts among which the flowers are inserted.—Growing on a wet bank in forest above Lancetilla, forming dense clumps; found only once; ranging to Mexico and Colombia.

ARISTOLOCHIACEAE. Birthwort Family

The species here listed are perennial herbaceous vines having alternate simple leaves without stipules. The perfect flowers are very irregular, without a corolla, the calyx being large and colored, somewhat inflated at the base, and expanding above into a large limb. There are 6 stamens. The fruit is an elongate 6-celled capsule.

ARISTOLOCHIA L.

Aristolochia grandiflora Sw. A large vine, the stems puberulent or glabrous; leaves broadly ovate-cordate, acute or long-acuminate; flowers very large, the calyx tube 12–20 cm. long, the limb 15–45 cm. long, dark purple within, terminating in a slender tail-like pendent appendage which sometimes is a meter long.—Occasional in wet thickets; widely distributed in Mexico, Central America, and the West Indies. Called "güegüecho" and "chompipe" in Nicaragua; "güegüechón" and "guaco" in Salvador; and "flor de guaco" in Mexico. The plant is sometimes grown in the North in hothouses because of its very remarkable flowers, and the names "duck flower" and "pelican flower" are applied to it. These terms are very descriptive, since the unopened flowers strongly resemble a duck, and they are of approximately the same size. They are probably the largest flowers produced by any American plant. The lurid coloring is conspicuous but not attractive, and the very offensive carrion odor of the blossoms does not encourage one to approach them too closely. The plant is much used in domestic medicine and is one of the popular remedies for snake bites. The roots are said to be poisonous.

Aristolochia pilosa HBK. A small herbaceous vine, the stems covered with long spreading brown hairs; leaves heart-shaped, obtuse or rounded at the apex, entire; calyx 5–7 cm. long, hairy, the limb pale green with purple-brown dots, the throat dark purple-brown.—Frequent in wet thickets; extending to Mexico and South America. Known in Guatemala as "sombrerito" and "hediondilla."

Aristolochia trilobata L. *Media-luna.* A nearly glabrous vine; leaves broader than long, 3-lobed, the lobes rounded; calyx large, bearing at the tip a slender appendage 12–15 cm. long.—Growing in thickets near the beach; ranging to South America and the West Indies. The plant is used about Tela as a remedy for colic and other pains.

POLYGONACEAE. Buckwheat Family

The family consists of herbs, shrubs, and trees, which are easy to recognize by the alternate entire leaves usually provided with sheathing stipules (ocreae). The flowers have a green or colored perianth consisting of 4–6 segments, and the fruit is a compressed or 3-angled achene.

ANTIGONON Endl.

Antigonon leptopus H. & A. *Bellísima. Coral-vine.* A large, herbaceous or suffrutescent vine, climbing high by tendrils at the

ends of the racemes; leaves triangular-cordate, nearly glabrous; flowers bright pink, in panicled racemes.—Planted commonly for ornament; native of western Mexico. Other species are native in western Central America. This species is known in various parts of Central America as "coralito," "cadena de amor," "colación," and "confite." Called Confederate vine in Florida. The plant is a handsome and showy one, and is popular all over Central America.

COCCOLOBA L.

The species of *Coccoloba* are shrubs or trees with persistent leaves. The flowers are small and greenish or pinkish, arranged in long racemes or spikes. The sepals or calyces are enlarged and usually fleshy in fruit, resembling a berry.

Coccoloba acuminata HBK. *Rabo de león* ("lion-tail"). A nearly glabrous shrub or small tree, rarely 4.5 meters high; leaves lance-oblong, long-acuminate, with tufts of short hairs beneath along the midrib; fruit bright red.—Common in thickets, especially near the coast; ranging from Guatemala to Colombia.—Called "papa-turrillo" in Nicaragua. The wood is creamy, with darker growth rings; it is odorless and tasteless. The long racemes of bright red fruits are conspicuous and ornamental.

Coccoloba anisophylla Standl. A nearly glabrous shrub or small tree 3–6 meters high; leaves almost sessile, obovate, acuminate, at the base very unequal and clasping; flowers and fruits unknown.—Frequent in wet forest; known only from this region.

Coccoloba barbadensis L. *Uva.* A glabrous tree 6–12 meters high with a short clean trunk and dense rounded crown; leaves elliptic-oblong, rather small, obtuse or short-pointed, leathery; flowers green.—Common in thickets and pastures about Tela; known in Central America only from this region, but growing also in the West Indies.

Coccoloba belizensis Standl. *Uva.* A large tree; leaves large and leathery, oval to ovate or broadly oblong, acute, cordate at the base, pubescent beneath, up to 45 cm. long.—In thickets and wet forest; occurring also in British Honduras, where it is called "wild grape." The reddish green fruit is much eaten by birds.

Coccoloba hirsuta Standl. *Uva, Uva de monte.* A large tree; leaves elliptic-oval or obovate, very large, rather thin, acuminate,

rounded or subcordate at the base, coarsely hairy on both surfaces.—In wet hill forest; known only from the Lancetilla Valley.

Coccoloba Tuerckheimii Donn. Smith. *Uva.* A shrub or small tree; leaves large, obovate, rounded and short-pointed at the apex, acute at the base, finely pubescent beneath or nearly glabrous; fruits about 1 cm. long.—In wet thickets near Lancetilla; also in Guatemala.

Coccoloba Uvifera (L.) Jacq. *Uva. Sea-grape.* A dense rounded shrub or a tree up to 8 meters high, nearly glabrous; leaves almost sessile, rounded, often broader than long, thick and stiff; fruit whitish or purplish, 2 cm. long, very juicy, edible.—Common on beaches; confined to seashores, but widely distributed in tropical America, and ranging northward to Florida. In colonial days the Spaniards sometimes used the cardboard-like leaves as a substitute for writing paper, impressing characters upon them with a pin. They employed the leaves also as playing cards. The bark, when cut, yields an astringent red sap, the source of West Indian kino, which, under the names gum kino, American kino, and American extract of rhatany, formerly was an article of trade. The wood is odorless, slightly astringent, hard, heavy, compact, fine-grained, red or dark brown tinged with red, fairly durable, strong but brittle, and takes a high polish. In Costa Rica the tree is called "papaturro"; in Mexico "uvero" and "manzano."

Muhlenbeckia platyclada Meisn., a native of the Solomon Islands, is sometimes planted for ornament. It is a curious leafless plant with broad ribbon-like branches. In Salvador it is known by the names "solitaria" and "pie de muñeco."

POLYGONUM L.

The three species here listed belong to the group of the genus called "smartweed" in the United States. They are coarse herbs with narrowly lanceolate leaves, their flowers in long racemes.

Polygonum acuminatum HBK. *Smartweed.* A stout herb as much as 1.5 meters high; leaves densely and finely hairy beneath; stipule sheaths with numerous long bristles along the margin; flowers greenish white.—Frequent in open swamps; widely distributed in tropical America.

Polygonum longiocreatum Bartlett. *Smartweed.* An erect herb a meter high or less; leaves glabrous, the sheaths without bristles;

flowers deep pink, in dense spikes.—In marshy fields near Tela; occurring also in Guatemala.

Polygonum punctatum Ell. *Smartweed.* A slender herb; leaves glabrous, the sheaths fringed with bristles; flowers greenish white or pinkish, in slender interrupted racemes.—In marshy or wet soil; widely distributed in tropical America. Called "chile de perro" in Costa Rica.

RUMEX L.

Rumex crispus L. *Yellow dock.* A few plants found in a horse corral at Tela; doubtless imported from the United States. The plant is a native of Europe.

CHENOPODIACEAE. Goosefoot Family

BETA L.

Beta vulgaris L. *Remolacha. Beet.* Beets are planted commonly and successfully in the local gardens.

AMARANTHACEAE. Pigweed Family

The amaranths are mostly weedy herbs, with alternate entire leaves. The flowers are small, usually green but sometimes white or colored, without petals, and arranged in spikes or heads, or sometimes panicled. The fruit is small and dry, a 1-seeded utricle, or in *Celosia* a several-seeded capsule.

ACHYRANTHES L.

The species of *Achyranthes*, of which two occur in Central America, have been introduced from the Old World, and have now become frequent weeds in waste ground. They are herbaceous plants with long spikes of slender green flowers which are abruptly reflexed. The bracts and sepals have straight spinelike tips, by which they adhere tenaciously to clothing and to the hair of animals.

Achyranthes aspera L. *Mozote.* Leaves acute; an erect or decumbent herb, the stems often a meter long.—Common in wet thickets or in waste places. The name "mozote" is equivalent to the English word "bur," and is applied generally in Central America to plants having burlike fruits. In Panama the name "cadillo" is given to plants of this sort. In Salvador this species is called "abrojo" ("eye-opener").

Achyranthes indica (L.) Mill. Leaves rounded or obtuse at the apex.—A common weedy herb of pastures and thickets. The green flowers often are tinged with pink.

ALTERNANTHERA Forsk.

A good many species of the genus grow in Central America, but only two have been collected in the Tela region. They are procumbent weedy herbs with dense sessile heads of flowers inserted in the leaf axils.

Alternanthera obovata (Mart. & Gal.) Standl. Flower heads mostly more than 1 cm. thick; utricle much shorter than the sepals; leaves rounded or very obtuse at the apex.—Found only at Guaymas, on an open weedy bank. The species has not been collected previously south of Guatemala.

Alternanthera sessilis (L.) R. Br. Flower heads less than 5 mm. thick; utricle obcordate, as long as the sepals; leaves acutish.—Common in wet thickets or open swampy ground.

Alternanthera versicolor (Lam.) Regel. *Colchón de niño.* A low erect plant with brightly colored red, pink, or purplish leaves.—Planted occasionally for ornament. The plant is known only in cultivation.

AMARANTHUS L. Pigweed, Amaranth

The pigweeds are common weedy plants of Central America. All are much alike in general appearance, and resemble those so well known in the United States. About Tela, as throughout Central America, the leaves are cooked and eaten as "greens" or pot herbs, a practice followed also in the United States.

Amaranthus dubius Mart. *Bledo de Jamaica. Pigweed.* Utricle smooth; leaves acute.—Infrequent, and doubtless introduced here, probably from the West Indies, or from elsewhere in Central America, where it is common. I was told that the plant had been introduced about Tela only recently, and by the Jamaicans, who call it "calalú." This name, said to be of East Indian origin, is applied by the West Indians living along the Atlantic coast of Central America to various plants whose leaves are cooked and eaten.

Amaranthus gracilis Desf. *Bledo. Pigweed.* An erect herb with acute leaves; utricle wrinkled.—A frequent weed in fields; introduced from the Old World tropics. It is seldom plentiful in Central American localities.

Amaranthus spinosus L. *Bledo. Spiny pigweed.* Easily recognized by the sharp spines inserted below the leaves.—One of the most common weeds of Central America, and plentiful about Tela; a well-known garden weed of the United States. The leaves of spiny pigweed are eaten, like those of the unarmed species. In Salvador this plant is called "huisquilite," a name of Aztec origin, signifying "spiny quilite," the word "quilite" or "quelite" being applied in Mexico to pot herbs of many kinds.

Amaranthus viridis L. *Bledo.* A procumbent succulent herb, distinguished by the leaves, which are deeply notched at the tip.—An infrequent weed here, and found only sporadically in Central America; introduced from the Old World.

CELOSIA L.

Celosia argentea L. *Moño. Cockscomb.* The garden cockscomb is grown here for ornament, and, as elsewhere in tropical America, it sometimes grows as a weed in waste ground, although never persisting long. The half-wild plants have simple spikes of white or purple-red flowers, degenerating rapidly from the garden form (var. *cristata*) with large fan-shaped fasciated inflorescences. This plant, although perhaps native in tropical America, probably is truly wild at present nowhere in the region. In Panama it is called "abanico" (fan); in Salvador "cresta de gallo" (cockscomb), "San José," "borla," and "terciopelo" (velvet).

CHAMISSOA HBK.

Chamissoa altissima (Jacq.) HBK. A coarse half-woody plant, often growing as a large vine over shrubs or small trees; leaves lanceolate or ovate, long-acuminate; flowers green, small, the two sexes on separate plants, forming large panicles.—The plant is widespread and abundant at lower altitudes in Central America, but it is rather inconspicuous, in spite of its large size, and no common name is reported for it.

The single black seed of the small utricle is surrounded by a conspicuous fleshy white aril. Botanists may thank the recent crossword craze for popularizing, among other botanical terms, the word "aril," which is employed so frequently in such puzzles that to crossword fans, at least, its meaning can need no explanation.

CYATHULA Lour.

Cyathula achyranthoides (HBK.) Moq. *Mozote.* A coarse herb with acute leaves; flowers in long dense spikes, abruptly reflexed;

sepals with hooked spinelike tips by which they catch hold of clothing and of the hair and skin of animals.—A common weed in fields and thickets. The plant resembles the species of *Achyranthes*, but in the latter the spines of the flowers are straight, not hooked.

GOMPHRENA L.

Gomphrena dispersa Standl. *Sanguinaria, Sangrinaria, Sesicante.* Flower heads white, about 1 cm. thick, sessile; a low procumbent herb.—A common weed in waste places; frequent in waste ground through most of Central America. In Guatemala the plant is called "botoncillo." About Tela it is said to be employed as a remedy for venereal diseases, and for affections peculiar to women.

Gomphrena globosa L. *Siempreviva. Globe amaranth, Bachelor's-button, Immortelle.* Flower heads about 2 cm. thick, usually purple-red or white, sometimes yellow.—Grown in gardens for ornament, as it is throughout tropical America. The plant is well known in United States gardens, where the flower heads are dried and used for winter bouquets. The plant is of American origin, but it is not known in the wild state. In Panama it is known sometimes by the name "suspiro."

IRESINE P. Br.

The Iresines are herbs or shrubs, usually inconspicuous, and often weedy. The leaves are opposite, and the very small, whitish or greenish flowers are mostly unisexual, disposed in small spikelets, which are arranged chiefly in panicles.

Iresine Celosia L. *Hierba de gato.* A coarse herb, often half climbing; flowers of the two sexes on separate plants, minute, greenish white, in large feathery panicles.—A common weed of thickets and waste ground, often clambering over bushes; widely distributed in tropical America. In Salvador it is called "siete pellejos" (sevenbark), "coyontura," "taba de güegüecho," and "hierba de la plata." The leaves have a bitter flavor.

Iresine Herbstii Hook. *Mano de lagarto.* Similar in habit to *I. Celosia,* of which it is probably a derivative; leaves purple-red, deeply notched at the apex.—Planted for ornament; known only in cultivation. Called "chorcha de gallo" in Salvador.

Iresine nigra Uline & Bray. A slender shrub, sometimes clambering; leaves ovate to lanceolate, glabrous or nearly so, turning dark when dried; spikelets arranged in large panicles.—Collected near Progreso; ranging to Salvador and southern Mexico.

PHILOXERUS R. Br.

Philoxerus vermicularis (L.) R. Br. A prostrate or procumbent, nearly glabrous, very succulent, perennial herb; leaves opposite, linear to oblong, 2–5 cm. long; flowers small, white, forming very dense, sessile or stalked heads 1–3 cm. long.—On sandy flats along the beaches; a widely distributed strand plant of tropical America, which occurs also on the west coast of Africa.

PLEUROPETALUM Hook. f.

Pleuropetalum Sprucei (Hook. f.) Standl. A nearly glabrous shrub 1.5 meters high, of inconspicuous appearance; leaves oblong-lanceolate, acuminate; flowers small, greenish, in small long-stalked panicles; fruit a small capsule containing several seeds.—Growing in wet forest; rare.

NYCTAGINACEAE. Four-o'clock Family

The plants of this family are mostly of little general interest. They are herbs, shrubs, or small trees, their leaves opposite or alternate and entire. The flowers are usually small and inconspicuous, but sometimes showy. Although they have no corolla, the calyx often is colored so as to resemble a corolla. The fruit is an anthocarp, the ovary at maturity being united with the enlarged calyx base.

BOERHAAVIA L.

The Boerhaavias are represented in Central America by the three species here listed. They are weedy herbs with opposite petioled leaves, minute, white, pink, or red flowers, and small dry club-shaped fruits.

Boerhaavia caribaea Jacq. A spreading sticky-pubescent herb with minute, dark red flowers; branches of the inflorescence viscid-pubescent; flowers in small heads or glomerules; fruit glandular-pubescent.—A common weed of waste places; widely distributed in tropical America. Called "clavellina" in Salvador.

Boerhaavia coccinea Mill. *Mozote.* A spreading perennial, the larger branches sparsely pubescent; leaves rounded or broadly ovate, their margins more or less undulate, the lower surface pale; branches of the inflorescence glabrous; perianth dark red, 1–2 mm. long; fruits glandular-pubescent, in small heads, 3–4 mm. long, angled.—Frequent in waste ground; a weedy plant widely distributed in

tropical America, but rare in most parts of Central America. Called "carasola" in Panama.

Boerhaavia erecta L. An erect annual, usually 30–60 cm. high, branched; leaves mostly ovate, petioled, pale beneath; flowers pinkish white, in loose cymes; fruit glabrous, 3–4 mm. long, truncate at the apex.—A weed in waste ground; rather scarce here, but widely distributed and an abundant weed in many parts of tropical America. Called "golondrina" and "iscorián" in Salvador.

BOUGAINVILLEA Commers.

Bougainvillea glabra Choisy. *Napoleona.* The well-known bougainvillea, native of Peru and Brazil, is planted here for ornament, as it is in most tropical regions. The vine is a very showy and handsome one when in flower, but its gaudy appearance depends not upon the flowers, which are small and inconspicuous, but upon the large, brightly colored bracts which surround the flowers. In Panama the vine is called "veranera" and "flor de verano"; in Salvador "manto de Jesús"; and variations of the Latin name are often used in Central America.

MIRABILIS L.

Mirabilis Jalapa L. *Clavellino. Four-o'clock.* A nearly glabrous, perennial herb with opposite leaves, and with large, showy, purple-red, white, or yellow flowers, which often are variegated or streaked with several colors. The flowers, which are very sweet-scented, open in the evening and close in the forenoon. This plant, although so common in cultivation in tropical America, and supposed to be of American origin, probably is not known in a truly wild state. When occurring spontaneously, it seldom is found far from gardens, and it does not appear to be able to succeed in competition with the more vigorous tropical weeds. Probably it is the descendant of some native plant long extinct. The four-o'clock is grown for ornament commonly in most parts of the United States. The plant is called "buenas tardes" in Panama, and "maravilla" in most parts of Central America. The English name "marvel of Peru" sometimes is used in the North.

NEEA Ruiz & Pavón

The genus is represented in Central America by several species of trees and shrubs having opposite or whorled leaves. The flowers are small and greenish, arranged in small cymes or panicles, the two sexes on separate plants. The fruit is an elongated drupe with scant flesh.

Neea acuminatissima Standl. A shrub 1–2 meters high with few branches; leaves short-petioled, oblong or elliptic-oblong, very large, mostly 30 cm. long or larger, very long-acuminate, glabrous; drupes 1.5 cm. long, red, dark purple, or pinkish white, juicy.—Frequent in wet forest about Lancetilla; known only from this region.

Neea psychotrioides Donn. Smith. A shrub or tree 3–6 meters high, nearly glabrous; leaves opposite or whorled, oblong or elliptic-oblong, mostly 6–10 cm. long, acute or acuminate, petioled; flowers very small, green, in loose panicled cymes.—Rather frequent in thickets, pastures, and swamps about Tela and Progreso; not noted near Lancetilla; ranging to Guatemala and Costa Rica. Known in Salvador as "sangre de chucho," "puruma," and "teñidor."

PISONIA L.

Pisonia aculeata L. *Cargalera.* A large shrub, the branches arching or often climbing over trees, armed with stout hooked spines; leaves opposite, mostly elliptic or ovate, acute or acuminate, densely hairy or nearly glabrous; flowers small, green, in dense cymes; fruit dry, club-shaped, 9–12 mm. long, 5-angled, the angles with a dense row of sticky glands.—Frequent in wet forest and thickets; widely distributed in tropical America, often along seashores. Called "espino negro" in Nicaragua and "cagalero" in Salvador. The sticky fruits adhere easily to birds and animals, and thus are widely dispersed.

PHYTOLACCACEAE. Pokeweed Family

The Honduran plants of this group are weedy herbs or shrubs of little importance. They have alternate entire leaves without stipules. The small and mostly inconspicuous flowers, arranged in spikes or racemes, have no petals, but the sepals often are colored and petal-like.

MICROTEA Sw.

Microtea debilis Sw. A low glabrous annual herb, spreading over the ground; leaves long-petioled, obovate, obtuse or acute; flowers minute, greenish white, in slender racemes; fruit very small, obovoid, dry, 1-seeded, covered with minute spinelike tubercles.—A frequent weed in thickets and open fields, common in banana plantations; widely distributed in tropical America.

PETIVERIA L.

Petiveria alliacea L. *Ipacina.* A coarse erect herb, or sometimes somewhat woody, nearly glabrous; leaves oblanceolate, acumi-

nate; flowers whitish or pinkish, in long slender spikes; fruit dry, with 4 hooked bristles at the tip.—Infrequent about Lancetilla, but a common and widely distributed weed of Central America, and of tropical America generally. Called "anamú" in Panama, and by the West Indians "gully-root" and "guinea-hen weed." When crushed, the plant has a strong and disagreeable odor, suggestive of garlic. It is reported that a garlic flavor is imparted to the milk and butter of cows browsing upon it. The plant finds some use in domestic medicine, and the West Indians often sniff the odor of a piece of the root to relieve headache. The sharp spines of the fruit catch hold of clothing and penetrate the skin readily and painfully if the plant is handled carelessly.

PHYTOLACCA L.

Phytolacca rivinoides Kunth & Bouché. *Quilete, Cola de ardilla. Pokeberry. Plate XXXV.* A coarse glabrous herb 1–2 meters high with large succulent leaves; flowers pink, in long graceful racemes; fruit juicy, black-purple, berrylike.—Common in clearings and abandoned fields; widely distributed in Central America. Called "jaboncillo" in Costa Rica, and by the West Indians "calalú." This species is exactly like the common pokeweed of the United States in general appearance. In Costa Rica the roots are utilized for washing clothes, since they make a copious suds when rubbed in water. The leaves and young shoots are cooked and eaten as greens in Honduras, as is the custom elsewhere. The name "quilete" is a corruption of the Aztec "quilitl," used to designate edible herbs generally.

RIVINA L.

Rivina humilis L. *Achotillo.* An erect, branched, slightly pubescent herb, often somewhat woody; leaves slender-petioled, ovate; flowers small, greenish white, in racemes; fruit 4 mm. long, juicy, bright red.—A common weed in thickets; generally distributed in tropical America. Known in Nicaragua as "coralillo," and in Colombia as "carmín." Sometimes called "rouge plant." The racemes of bright red berries are conspicuous and rather pretty.

TRICHOSTIGMA A. Rich.

Trichostigma octandrum (L.) H. Walt. A large glabrous shrub, often trailing over bushes; leaves slender-petioled, oblong to ovate, acuminate; flowers pale green, in slender racemes, the long stamens white; fruit juicy, 1-seeded.—In thickets, but not common;

widely distributed in the Central American lowlands. Called "sota-caballo" in Costa Rica.

AIZOACEAE. Carpet-weed Family

The plants of this group are low herbs with entire leaves, the stipules small and scarious, or none. The small and commonly inconspicuous flowers are perfect and regular, with 4–5 distinct or united sepals, small or no petals, and definite or very numerous stamens. The fruit is a small capsule.

GLINUS L.

Glinus radiatus (R. & P.) Rohrb. A prostrate or ascending annual, covered with fine branched hairs; leaves opposite, thin, petioled, elliptic to spatulate, rounded to acutish at the apex; flowers clustered in the leaf axils, the sepals 4 mm. long; petals none; capsule enclosed in the calyx.—Noted only in an open field at La Fragua; widely distributed in tropical America, but in Central America found chiefly on the Pacific coast. An inconspicuous weedy plant, perhaps introduced here.

MOLLUGO L.

Mollugo verticillata L. *Carpet-weed.* A prostrate glabrous annual, much branched; leaves in whorls of 5 or 6, linear-spatulate, 1–2.5 cm. long; flowers pediceled in the leaf axils, the sepals scarcely 2 mm. long, whitish; petals none; capsule 3-celled, slightly longer than the sepals.—Common in cultivated fields and waste places; widely distributed in both hemispheres; a common weed of many parts of the United States.

SESUVIUM L.

Sesuvium Portulacastrum L. A perennial, glabrous, very fleshy herb, the stems usually very long and rooting at the joints; leaves thick, linear to oblanceolate, sessile, 1.5–4 cm. long; sepals 6–10 mm. long; petals none; stamens rose-purple, rather showy.—Common along the beach; widely distributed in both hemispheres; a characteristic strand plant.

PORTULACACEAE. Purslane Family

The local representatives of this family are fleshy, annual or perennial herbs with entire leaves. The perfect and regular flowers have 2 sepals and 4–5 petals, the stamens being twice as many as

the petals or more numerous. The fruit is a small many-seeded capsule.

PORTULACA L.

In the Portulacas the capsule is wholly or only partly inferior, and opens by a circular lid. The petals are very thin, and soon wither, the flowers opening early in the morning and closing about noon.

Portulaca oleracea L. *Verdolaga. Pusley.* A glabrous prostrate annual with flat but fleshy, wedge-shaped leaves 1–3 cm. long; petals small, yellow.—A common weed in fields and waste places; widely distributed in both hemispheres. About Tela the plant is cooked and eaten like spinach, as it is throughout Central America, as well as in some parts of the United States.

Portulaca pilosa L. *Hiedra.* A small decumbent annual or perennial, with dense tufts of long soft whitish hairs in the leaf axils; leaves very fleshy, terete, 8–15 mm. long; flowers 8–12 mm. broad, rose-purple.—On open banks near Progreso; common under coconut palms at Tela, in sand; widely distributed in America. Called "colchón de niño" in Salvador, and "verdolaga" or "cabeza de vaca" in Nicaragua. The significant name "diez del día" is reported from Cuba.

TALINUM Adans.

Talinum triangulare (Jacq.) Willd. *Espinaca. Philippine spinach.* An erect succulent herb 30–80 cm. high, glabrous, perennial; leaves obovate, 4–9 cm. long or larger, rounded at the apex; flowers in axillary racemes or clusters, pink or whitish, the petals 12 mm. long; capsule superior.—Cultivated at Lancetilla as a pot herb; widely distributed in tropical America. The fleshy leaves when cooked make an excellent substitute for spinach, and the plant is worthy of extensive cultivation in the tropics. It grows like a weed, and furnishes a continuous supply of new leaves. In cultivation it has a curious history. It is native of Central America, and grows wild in some parts of Honduras, but in some manner it reached the Philippines, where its value was learned and appreciated. The plants grown at Lancetilla are from seeds imported from the Philippines.

BASELLACEAE. Basella Family

BASELLA L.

Basella rubra L. *Espinaca.* A large glabrous herbaceous vine; leaves alternate, petioled, broad, entire or nearly so, very fleshy;

flowers small, white or red, in simple spikes arising from the leaf axils.—A native of the Old World tropics, cultivated in the region as a vegetable. The leaves and young tender shoots are cooked and eaten like spinach, for which they make a good substitute.

CARYOPHYLLACEAE. Pink Family

DRYMARIA Willd.

Drymaria cordata (L.) Willd. *Palitaria.* A slender glabrous procumbent annual; leaves opposite, petioled, rounded, entire, with minute stipules; flowers very small, greenish, in slender-stalked few-flowered cymes arising from the leaf axils; fruit a small 3-valved capsule.—A common weed of thickets, fields, and waste places; sometimes growing in forest; widely distributed in tropical regions. Known in Salvador by the names "petatillo," "comida de canario," "trencilla," "comapa," and "chischina." The plant is sometimes used in domestic medicine.

Some of the species of *Dianthus* (one of them probably is *D. chinensis* L.) are grown for ornament in the Tela region, under the name "clavel."

NYMPHAEACEAE. Waterlily Family

NYMPHAEA L. Waterlily

These waterlilies are much like those of other parts of the world, being large aquatic herbs with floating, deeply cordate leaves, and large showy white flowers.

Nymphaea ampla (Salisb.) DC. Leaves large, thick, coarsely toothed, purple beneath; flowers 7–13 cm. broad.—Frequent in quiet streams and in lakes or pools; widely distributed in tropical America. Called "ninfa" in Salvador. The plant is a very showy and handsome one.

Nymphaea blanda Mey. Leaves thin, entire, green on the lower surface.—Frequent in pools; extending from Guatemala to the Guianas.

RANUNCULACEAE. Buttercup Family

CLEMATIS L.

Clematis dioica L. A large woody vine; leaves opposite, once or twice pinnate, the large leaflets long-stalked, ovate, toothed or almost entire; flowers white, panicled; fruit a cluster of achenes

having long hairy tails.—In thickets near Progreso; widely distributed in tropical America. Called "barba de viejo" and "cabellos de ángel" in various parts of Central America; other names are "crespillo" (Nicaragua) and "hierba de mendigo" (Salvador). In general appearance the plant is much like the common *Clematis virginiana* L. of the United States.

MENISPERMACEAE. Moonseed Family

The Honduran Menispermaceae are usually woody or herbaceous vines, or sometimes shrubs or small trees, with alternate entire leaves without stipules. The small greenish flowers are dioecious, that is, the flowers of the two sexes are borne upon separate plants; they have 4 or more sepals and 6 petals. The stamens are of the same number as the petals or fewer. The fruit consists of a single 1-seeded drupe or of a cluster of 2 or 3 drupes.

CISSAMPELOS L.

These plants are vines, usually woody at the base, but with chiefly herbaceous branches which climb high over shrubs and trees. The leaves are long-stalked and peltate, with the petiole attached well above the base of the blade, the blades being rounded or broadly ovate and usually cordate at the base. The staminate flowers, arranged in large open panicles, have 4 sepals; the pistillate flowers, in racemed clusters, have a single rudimentary sepal and only one petal. The fruit is a compressed red drupe, its stone strongly compressed and tubercled.

Cissampelos grandifolia Triana & Planch. *Plate XXXVI.* A large woody vine; leaves mostly 7–15 cm. long, acute, green above and glabrous or nearly so, beneath paler and pubescent along the nerves; staminate panicles very large and lax, the flowers green; pistillate racemes not bracted; fruit 5–6 mm. long.—Occasional in wet thickets and wooded swamps; ranging to Costa Rica and Colombia.

Cissampelos Pareira L. A large woody vine; leaves broadly ovate to rounded or kidney-shaped, 3–10 cm. long, the petiole often attached close to the base, the blades usually tomentose beneath; staminate flowers green, in small panicles, the pistillate panicles provided with large bracts; fruit red, 4–5 mm. broad.—In swamps and thickets; widely distributed in tropical America, also in the tropics of the Old World. The plant is abundant in many parts of

Central America, where it is much used in domestic medicine. The usual name for it is "alcotán," but in Costa Rica it is called also "bejuco azul" and "venadero," and in Nicaragua "picamano." When covered with its orange or red fruits, which contrast with the soft grayish leaves, the plant is a rather handsome one.

DISCIPHANIA Eichl.

Disciphania calocarpa Standl. A large glabrous woody vine, the larger stems with thick ridged corky bark; leaves on very long stalks, peltate, broadly ovate, acute; pistillate flowers arranged in long narrow racemes which are pendent from the old naked stems; fruit oval, 2 cm. long, bright red, very juicy and fleshy.—Climbing high on trees in wet forest; known only from this region. The genus is not known elsewhere in Central America, the other species growing in South America, especially in Brazil.

HYPERBAENA Miers

The species of this genus are woody vines or erect shrubs or small trees. The leaves are often leathery and usually have 3 or more nerves arising at or near the base. The staminate flowers are arranged in panicles and have 6 sepals and 6 petals; the pistillate are racemose and have the same number of sepals and petals. The large drupaceous fruits are juicy, and contain a single horseshoe-shaped seed.

Hyperbaena hondurensis Standl. A small or large woody vine; leaves long-stalked, oblong to ovate, abruptly acute or short-acuminate, broadly rounded at the base, nearly glabrous, 5-nerved from the base; flowers and fruit not known.—Common in forest and thickets; known only from this region.

Hyperbaena phanerophlebia Standl. A slender glabrous shrub 3–4 meters high; leaves leathery, oblong or lanceolate, acuminate, acute at the base, on short petioles, glabrous, lustrous, 3-nerved from well above the base of the blade; fruit globose, greenish yellow, 2 cm. in diameter or larger.—Occasional in wet forest; known also from Salvador, where it is a tree of 5–8 meters, and is called "umineishte."

ANNONACEAE. Custard-apple Family

The plants of this family are trees or shrubs with alternate entire leaves, without stipules. The usually dark-colored flowers are either solitary or clustered, and have 3 sepals, commonly 6 fleshy or

leathery petals, and often very numerous stamens. The fruit is composed of few or many carpels which are either sessile or stalked, and either free and berrylike or united to form a large compound fruit.

ANNONA L.

To this group belong some of the most highly esteemed fruits of tropical America, but some of the species producing fruits of the best quality are not found in the region here under consideration. The Annonas are trees with either persistent or deciduous leaves, their flowers usually solitary and lateral on the branches. The fruit consists of numerous fleshy carpels which are crowded and fused together so as to form a large fleshy body.

Annona glabra L. *Anona.* A glabrous shrub or tree, sometimes 6 meters high, the bark thin, reddish brown; leaves oblong to ovate, acute or acuminate; flowers subglobose, large, the outer petals leathery, yellowish, with a deep red spot near the base; fruit ovoid, 5–12 cm. long, smooth, yellowish at maturity, with cream-colored pulp.—Frequent in thickets near the beach; widely distributed in tropical America, and ranging north to Florida. Called "anón de puerco" in Panama and "anonillo" in Guatemala. The English names are pond-apple, alligator-apple, and monkey-apple. The fruit is insipid in flavor and is seldom eaten. The light and corklike wood is sometimes employed in making floats for fish nets and stoppers for bottles.

Annona muricata L. *Guanábana. Soursop.* A glabrous tree 4.5–7.5 meters high; leaves persistent, oblong to obovate, acuminate, short-stalked; flowers large, globose, the thick leathery petals yellow; fruit very large, ovoid, covered with stout fleshy spines.—Cultivated frequently, and sometimes found half wild about the sites of former dwellings; cultivated generally in tropical America. The fruits are frequently as large as a child's head, and so heavy that they drag the lower branches to the ground. The pulp is white, very juicy, and somewhat acid, with a distinctive and highly agreeable flavor. It is used commonly for flavoring beverages and ices, and is highly esteemed for that purpose.

Annona purpurea Moc. & Sessé. *Sencuya.* A medium-sized tree; leaves mostly obovate, large, nearly sessile, acuminate, more or less brownish-felted beneath; flowers large, ovoid, velvety outside, dark purple within; fruit ovoid, 10–20 cm. in diameter, covered with hard rigid protuberances and with a dense brownish felt, the pulp

orange-colored, fragrant, fibrous.—Only one tree was seen in the region, planted at a native dwelling near Lancetilla. It had been brought from the interior, where the tree is common in some regions. It is frequent all along the Pacific slope of Central America and in Mexico. The fruit is called "guanábana torete" in Panama, in Costa Rica "soncoya," and in Guatemala sometimes "matacuy," but "sencuya," or variations of it, is the usual name in Central America. The fruit is little esteemed, for it is of very inferior quality.

Annona testudinea Safford. A glabrous tree 6–9 meters high; leaves short-petioled, oblong, 25–35 cm. long or larger, abruptly short-acuminate, obtuse or rounded at the base, glabrous; flowers narrow; fruit globose, 8–10 cm. in diameter, the surface divided by slightly raised ridges into irregular polygonal areas, the shell thick and hard.—Frequent in wet forest; occurring also in the lowlands of Guatemala. The type material was collected near Tela by Percy Wilson in February, 1903. The pulp of the fruit is sweet and watery and edible. The skin is grayish or bluish green, becoming purplish at maturity. The leaves when crushed have the same aromatic odor that characterizes those of *A. muricata*. An illustration of this species was published with the original description: Journ. Washington Acad. Sci. 3: 106. *f. 2.* 1913.

GUATTERIA Ruiz & Pav.

The Guatterias are shrubs or trees, their flowers solitary or clustered in the leaf axils or on naked branches. The fruit is a cluster of one-seeded stalked berries. The outer petals are more or less imbricate in bud.

Guatteria amplifolia Triana & Planch. A tree 4.5–9 meters high, the bark smooth and whitish; leaves short-stalked, oblong to elliptic, 20–35 cm. long, abruptly short-acuminate, obtuse or rounded at the base, nearly glabrous; flowers 3 cm. broad or larger, pale green or cream-colored, with 6 thick fleshy petals; fruit a cluster of numerous small oval berries borne on bright red stalks.—Occasional in wet mountain forest; ranging to Guatemala and Panama.

Guatteria depressa (Baill.) Safford. A tree 4.5–7.5 meters high with pale smooth bark; leaves oblong to elliptic-oblong, mostly 11–17 cm. long, acute or acuminate, obtuse to acute at the base, rather leathery, glabrous; petals large, rounded, spreading; fruit a cluster of numerous thick ellipsoid berries about 1.5 cm. long, borne on long slender red stalks.—Frequent in wet forest and thickets; ranging to southern Mexico.

Guatteria grandiflora Donn. Smith? A tree 6 meters high; leaves elliptic-oblong, 11–15 cm. long, long-acuminate, glabrous; berries subglobose, on very short stalks.—Incomplete material perhaps referable to this Guatemalan species was collected in the wet forest above Lancetilla.

ROLLINIA St. Hil.

Rollinia Jimenezii Safford? *Anona.* A tree 6 meters high; leaves short-stalked, oblong-elliptic, acuminate, obtuse or rounded at the base, thin, 20–30 cm. long, nearly glabrous.—Material possibly referable to this species was collected in thickets about Lancetilla, but it is sterile, and very probably represents a different species. In the genus *Rollinia* the large fruits somewhat resemble those of the Annonas, but the fleshy carpels or divisions are nearly distinct, cohering only slightly. The fruits of some species are very good to eat.

SAPRANTHUS Seem.

Sapranthus campechianus (HBK.) Standl. *Palanco.* A shrub or small tree; leaves nearly sessile, obovate-oblong, short-acuminate, obtuse at the base, thin, densely pubescent beneath; flowers solitary, the purple-brown petals about 4 cm. long; fruit of distinct several-seeded fleshy carpels.—Frequent in thickets near the beaches; ranging to Yucatan. The fruit is said to be edible. The flowers of all the species of *Sapranthus* have a very strong and offensive odor.

UNONOPSIS R. E. Fries

Unonopsis sp. A tree apparently referable to this genus was found in fruit on the hills above Lancetilla. It does not belong to the single species recorded from Central America (Panama), but the material is too imperfect for description. It is a tree 12 meters high with a trunk 30 cm. in diameter, the leaves oblong and short-acuminate. The flowers are borne on the older branches. The fruit consists of a cluster of large oblong berries about 7 cm. long containing numerous seeds.

MONIMIACEAE. Monimia Family

The Central American plants of this family are shrubs or small trees, often with stellate pubescence, their leaves opposite and short-petioled. The small greenish flowers are produced in the axils of the leaves, in small fascicles or panicles, and have 4 sepals, no petals, and usually numerous stamens.

MOLLINEDIA R. & P.

Mollinedia Butleriana Standl. A shrub or small tree, sometimes 6 meters high, with short-stalked, oval or rounded leaves, rounded or obtuse at the apex, and minutely pubescent beneath; flowers green, obovoid, 4 mm. long; fruit a cluster of small green drupes.—Frequent on forested hillsides; known only from the vicinity of Lancetilla. Other species occur along the Atlantic slope of Central America.

SIPARUNA Aubl.

Siparuna Tonduziana Perk. A shrub 2–3.5 meters high, probably becoming a small tree; leaves large, short-petioled, obovate, hairy, coarsely toothed; fruit globose, red, fleshy, with pungent flavor, splitting open irregularly when ripe.—Frequent in wet upland forest. Easily recognized by the strong lemon odor of the crushed leaves. The species has been known previously only from Costa Rica and Panama.

The name "limoncillo" is given to some species of the genus in Central America. *S. nicaraguensis* Hemsl., with entire, nearly glabrous leaves, has been collected at Siguatepeque, Honduras.

MYRISTICACEAE. Nutmeg Family

The representatives of this family are shrubs or trees, glabrous or pubescent, with alternate entire petioled leaves, and no stipules. The small flowers are dioecious, often arranged in umbels and variously panicled. They are regular and have commonly a 3-lobed perianth whose lobes are valvate in bud. The fruit is fleshy, dehiscing by valves, and containing a single seed which is covered by a lacelike aril.

COMPSONEURA Warb.

Compsoneura Sprucei (A. DC.) Warb. A glabrous shrub or small tree, sparsely branched, 5 meters high or less; leaves oblong or obovate-oblong, large, abruptly short-acuminate, acute at the base; flowers very small, in small lateral panicles, yellowish; fruit oval, 2.5–3 cm. long.—Frequent in wet forest or thickets; widely distributed in Central and South America.

VIROLA Aubl.

The members of the genus are large trees, their leaves short-stalked, alternate, oblong, acute or acuminate, entire, and without stipules. The small and inconspicuous flowers, arranged in small

stalked axillary panicles, have a 3-lobed perianth and 3–6 stamens. Several species of the genus are important forest trees of Central America. They are closely related to the nutmeg (*Myristica fragrans*) of the East Indies.

Virola guatemalensis (Hemsl.) Warb. *Sangre. Plate XXXVII.* One of the large forest trees of the region, often 18 meters high or more; leaves mostly 15–20 cm. long, pale beneath and nearly glabrous; fruits 3–3.5 cm. long, ellipsoid, tinged with red and yellow; seeds about 2 cm. long.—One of the most common trees of the Lancetilla region; also in Guatemala. The wood of the Central American Virolas is pale brown, of light weight but firm, somewhat coarse in texture, straight-grained, and not durable. It is said not to be used on the coast of Honduras. The vernacular name *sangre* ("blood") alludes to the red sap, and to the fact that red spots appear on the wood when it is exposed.

The seeds of this and other Virolas are very handsome, being dark brown and covered with a beautiful lacelike aril, after the manner of the nutmeg seed. Virola seeds are rich in oil. It is reported that oil obtained from the seeds of this species is used in Guatemala for making soap and candles. The Panama Indians sometimes string Virola seeds on sharp splinters and use them as candles.

Virola merendonis Pittier. *Sangre.* A large tree like the preceding, which this closely resembles; leaves 15–25 cm. long, covered beneath with a brown tomentum.—Common in wet forest; also in Nicaragua. Known in Nicaragua as "banak" (Mosquito name) and "sangre de drago." The aril veiling the seed is salmon-red. The seeds are a favorite food of monkeys and guatusos.

LAURACEAE. Laurel Family

The American laurels are well represented in most parts of Central America, constituting a group very difficult to study on account of the complicated structure of the flowers. The species are not well understood because so little good material has been collected in the region. In order to determine the species accurately it is necessary to have flowering specimens, and apparently the trees are in blossom for only a short period of time. The plants are shrubs or trees with alternate entire leaves without stipules, and with small, greenish or yellowish flowers. These have a 6-lobed perianth, with usually twice as many stamens and staminodia as perianth lobes, the anthers being erect and 2- or 4-celled. The fruit is drupelike, 1-seeded, and sur-

rounded at the base by the persistent cuplike calyx tube, the whole often resembling closely an acorn and its cup.

Among the better known representatives of the family are the sassafras (*Sassafras officinale*) of the United States, and the classical laurel (*Laurus nobilis*) of Europe.

MISANTECA C. & S.

Misanteca capitata C. & S. *Aguacatillo.* A tree 9 meters high, nearly glabrous; leaves short-petioled, oblong to elliptic, 12–25 cm. long, acuminate, obtuse at the base, leathery; flowers in long-stalked few-flowered heads arising from the leaf axils, the heads in flower 1–1.5 cm. broad; fruits about 2 cm. long, half enclosed in a deep red cup.—Occasional in thickets and forests; ranging to southern Mexico. In Mexico the wood is valued for carpentry and cabinet work.

NECTANDRA Roland

The Nectandras are large or small trees with leathery leaves. The small greenish flowers, arranged in small, axillary or terminal cymes, have 9 perfect stamens.

Nectandra glabrescens Benth. A large or small tree, nearly glabrous; leaves lance-oblong to elliptic, 10–18 cm. long, acuminate, acute or abruptly decurrent at the base.—In wet forest and thickets; ranging from southern Mexico to Colombia. The determination of the Honduran specimens is doubtful. The tree is called "aguacatillo" in Guatemala.

Nectandra globosa (Aubl.) Mez. *Aguacatillo, Sangre blanca.* A large or small tree, nearly glabrous; leaves oblong-lanceolate or narrowly lanceolate, very long-acuminate, conspicuously veined; flowers white, rather showy.—Frequent in forests; widely distributed in Central America. Called "sigua," "sigua blanco," and "sigua negro" in Panama, and "canelón" and "aguacate del monte" in Salvador. By the West Indians of the Canal Zone the tree is called "candlewood," because it is said that the dry wood burns easily and is suitable for making torches.

Nectandra membranacea Griseb. A large tree, nearly glabrous; leaves narrowly lanceolate or lance-oblong, long-acuminate, acute at the base, leathery.—In forests; widely distributed in tropical America.

OCOTEA Aubl.

Ocotea cernua (Nees) Mez. *Aguacatillo.* Usually a tree of 6–8 meters, glabrous or nearly so; leaves slender-petioled, elliptic or oval-elliptic, 10–15 cm. long, abruptly caudate-acuminate, obtuse or acute at the base, leathery; flowers very small, glabrous, in slender few-flowered inflorescences.—Common in thickets and wet forests; ranging from southern Mexico through Central America, and in the West Indies.

PERSEA Gaertn.

The Perseas are large or medium-sized trees with long-petioled, deciduous but thick leaves. The comparatively large flowers have 6 large equal sepals and 9 fertile stamens which are 4-celled. The fruits in this genus are sometimes very large, much larger than those of other Central American representatives of the family.

Persea americana Mill. *Aguacate. Avocado, Alligator pear.* This is one of the commonest fruit trees of Central America, too well known to need description. It is grown at all elevations, and often in great abundance. The avocados produced in the mountains commonly are assumed to be the best, but those of low elevations often are very good, and no avocado is altogether bad. The fruit is one of those most highly esteemed by the native people of Central America, especially because it provides them with an abundant, cheap, and nutritious food. It is unfortunate that the fruiting season in most regions is a comparatively brief one, and the fruits are not available during the long dry season. At the present time the avocado is being grown upon a large scale in Florida and California, and it is becoming increasingly popular in North American markets.

Persea Schiedeana Nees. A large tree; leaves large, usually broadly rounded or even somewhat cordate at the base, more or less woolly beneath; flowers 6–8 mm. long, pale greenish yellow, in age turning crimson or light rose at the base.—Occasional on the hills above Lancetilla; extending to Panama and southern Mexico. Called "aguacatón" in Panama and "coyó," "coyocté," and "chucté" in Guatemala. This wild avocado has a fruit much like that of *P. americana.* It has a thick but pliable skin, and brownish white flesh of fine oily texture and good flavor.

PHOEBE Nees

Phoebe mexicana Meissn. *Aguacatillo.* A tree about 9 meters high, nearly glabrous; leaves oblong or oblong-lanceolate, conspicu-

ously 3-nerved above the base, often very pale beneath, acuminate; flowers pilose.—Frequent in thickets about Tela; extending to southern Mexico and reported from Costa Rica.

CASSYTHA L.

Cassytha filiformis L. A slender glabrous leafless vine, the green stems twining about herbs or shrubs; flowers greenish white, 2 mm. long, in short spikes; fruit globose, small and berrylike, 6 mm. long.—Collected near Tela, but apparently not common here; widely distributed in the tropics of both hemispheres, but uncommon in Central America. In general appearance the plant has little resemblance to other Lauraceae, but suggests rather the dodders (species of *Cuscuta*).

HERNANDIACEAE. Hernandia Family

HERNANDIA L.

Hernandia guianensis Aubl. A small or medium-sized tree without buttresses; leaves alternate, long-stalked, broadly oblong to rounded-ovate, usually rounded and short-pointed at the apex, subcordate or rounded at the base, sometimes subpeltate, glabrous or nearly so; flowers white, finely tomentose, in long-stalked cymes; corolla none; fruit 1-seeded.—Occasional in thickets and forests; ranging from Mexico to northern South America. Called "aguacatillo" in Costa Rica and "lampa" in Panama. The wood is light, coarse-grained, easy to cut and split, and soft. The tree is an inconspicuous one, and little is known of its occurrence in Central America.

SPARATTANTHELIUM Mart.

Sparattanthelium guatemalense Standl. A small tree, the leaves thin, alternate, slender-petioled, without stipules, the blades oblong to elliptic, abruptly short-acuminate, entire, obtuse to rounded at the base, 3-nerved, nearly glabrous; young parts slightly silky-pilose; flowers small, in terminal many-flowered cymes; petals none; ovary 1-celled; fruit a drupe, 1-seeded.—Collected in a wet thicket near Progreso; the species, the only one known from Central America, grows also in Guatemala.

CRUCIFERAE. Mustard Family

Herbaceous plants with alternate, simple or compound leaves, without stipules; flowers mostly small, regular, with 4 sepals, and 4 petals which are opposite in pairs; stamens 6; fruit dry, commonly

2-celled, dehiscent or indehiscent. The family is a large one in most temperate regions, but in the tropics there are only a few species.

BRASSICA L.

Brassica chinensis L. *Chinese cabbage.* This plant, with long narrow succulent leaves, which form dense elongate heads, is grown successfully in the garden at Lancetilla.

Brassica oleracea L. *Repollo. Cabbage.* This is one of the vegetables most commonly grown in gardens, and it seems to thrive moderately well, in spite of the tropical climate.

Brassica Rapa L. *Nabo. Turnip.* Turnips are grown in the company's gardens in the Tela region, and probably also in the native gardens.

One of the mustards (*Brassica* sp.), called "mostaza," was noted in cultivation, but the plants were not in flower and no specimens were obtained, consequently the species is uncertain.

CAKILE Mill.

Cakile lanceolata (Willd.) Schulz. A coarse glabrous fleshy annual, procumbent or ascending; leaves petioled, lanceolate, runcinate-toothed; flowers 6–8 mm. long, purplish or white, on short pedicels, arranged in long racemes; fruit 2–3 cm. long, indehiscent, 2-jointed, the upper joint beaklike.—On beaches near Tela; ranging to Mexico, Colombia, and the West Indies.

NASTURTIUM R. Br.

Nasturtium portoricense Spreng. A low, erect or ascending annual; leaves thin, pinnatifid, the segments coarsely toothed or lobed; flowers minute, white, in long slender naked racemes; pods linear, dehiscent.—Collected in a weedy field near Tela, and found, besides, in the interior; also in the West Indies. Not reported previously from Central America, and perhaps introduced there.

CAPPARIDACEAE. Caper Family

The local members of this family are herbs, shrubs, or trees with alternate compound leaves. The flowers are axillary or in racemes or corymbs, and have 4–8 sepals, 4 petals, and few or many long stamens. The fruit is many-seeded. The best-known plant of the family is the Old World caper, *Capparis spinosa*, whose flower buds

are used as a condiment. Several species of *Capparis* occur in Central America, and some of them are to be expected along the coast of Honduras.

CLEOME L.

The Cleomes are herbs with compound leaves, the species here listed having leaves composed of three entire leaflets. The small whitish flowers are inserted in the axils of the leaves or arranged in terminal racemes. The fruit is a long slender pod containing numerous seeds.

Cleome ciliata Schum. & Thonn. A large procumbent herb, sparsely hairy; leaflets ovate or rhombic and 2.5 cm. long or smaller, acute or acuminate; flowers inserted in the axils of the leaves, solitary; petals white; pods about 5 cm. long, stalked.—A weed in garden at Lancetilla; the plant is a native of Africa, but has become established at a few places in the West Indies. Probably it has been brought to Lancetilla with seeds or soil from the Old World, or possibly from the West Indies. So far as I know, the species has not been found previously in Central America.

Cleome serrata Jacq. An erect glabrous herb a meter high or less; leaflets lanceolate or narrowly lanceolate, long-attenuate, mostly 8–12 cm. long; petals greenish white; pods 7–8 cm. long.—A common weed in thickets and waste ground, often growing in banana plantations; widely distributed in tropical America.

CAPPARIS L.

Capparis Tuerckheimii Donn. Smith. A large shrub or a small tree 7–8 meters high, glabrous; leaves long-petioled, lanceolate or oblong-lanceolate, long-acuminate; flowers white, in short few-flowered terminal racemes.—Occasional in wet forest; occurring also in Guatemala.

CRATAEVA L.

Crataeva Tapia L. A tree, sometimes 9 meters high, glabrous throughout; leaves long-stalked, the 3 leaflets oblong to elliptic, entire, acute or acuminate, pale beneath; flowers green or purplish, in corymblike racemes, the sepals 5–7 mm. long; petals long-clawed; stamens 5–6 cm. long; fruit globose, green or yellowish, 2.5–5.5 cm. in diameter.—Occasional in thickets and forest; widely distributed in tropical America. The name "cachimbo" is reported for this tree from Honduras. Other names applied to it are "palo de guaco"

(Panama), "manzana de playa" (Nicaragua), "anonillo" and "granadillo macho" (Salvador). The wood is white or yellowish, only moderately hard, of medium texture, brittle, and not durable. In Central America it is not used. When first cut it is reported to have the odor of garlic. The sap, when in contact with the skin, is said to cause blisters.

CRASSULACEAE. Orpine Family

BRYOPHYLLUM Salisb.

Bryophyllum pinnatum (Lam.) Kurz. *Hoja de la vida. Life-plant.* A glabrous perennial herb; leaves very fleshy, opposite, pinnate, the 3 or more leaflets coarsely crenate; flowers panicled, the greenish calyx large and inflated, the corolla brown-red and green.—Cultivated and sometimes escaping from cultivation; native of the Old World tropics, but naturalized in many places in tropical America. Called "hoja del aire" and "sanaltodo" in Salvador. The plant is much like the live-for-ever grown in the United States. Its leaves possess remarkable vitality, for if merely laid upon the soil, or even upon a stone, they produce young plants from the notches in the leaflets.

ROSACEAE. Rose Family

The Central American plants of the Rose Family are trees or shrubs which have little general resemblance to the more familiar relatives of the North. The ones here listed have alternate persistent leaves with inconspicuous stipules, and inconspicuous flowers variously arranged. In all of them the fruit is fleshy. Some of the cultivated roses of Old World origin are grown in gardens about Tela. Several species of blackberries, with edible fruit of good quality, grow in the mountains of Honduras.

CHRYSOBALANUS L.

Chrysobalanus Icaco L. *Icaco. Coco plum.* A shrub or very small tree with thin, scaly, brownish gray bark; leaves rounded, glabrous; flowers small, whitish, in short cymes; fruit globose or nearly so, 2–4 cm. in diameter, white, pink, purple, or black, juicy, with sweet white flesh.—Common on beaches; generally distributed in tropical America in similar places. About Tela the coco plum is only a shrub, but it forms an important part of the vegetation along the seashore. The fruit is edible, but not of particularly attractive flavor. The wood is light brown, often tinged with red, heavy, hard,

and strong, but it is seldom used except for fuel. The bark and leaves are astringent, and the seeds are rich in oil. This shrub extends northward as far as Florida.

COUEPIA Aubl.

Couepia dodecandra (DC.) Hemsl. *Munzap.* A small tree, usually about 10 meters high; leaves oblong or elliptic, obtuse or acutish, entire, covered beneath with a fine feltlike whitish tomentum; flowers white, in small panicles, each with 10–15 stamens and small petals; fruit ellipsoid, about 5 cm. long, containing one or two seeds.—Only one tree was noted, along the beach west of Tela, where probably it had been planted. The species grows also at La Ceiba, and is rather widely distributed in Central America, but little is known concerning it. The large fruits are edible. The tree is said to be called "baboon cap" in British Honduras and is known in Yucatán as "uspib."

HIRTELLA L.

Hirtella americana L. *Pasta.* A shrub, usually 1.5–2.5 meters high, with dense foliage; leaves small, oblong or elliptic, acute, thick, nearly glabrous; flowers pink or purplish, in long racemes, each flower with 5 long stamens; fruit about 1 cm. long, plumlike, dark red or purplish, juicy, not edible.—Frequent in thickets near the beach; widely distributed in tropical America. Called "icaco montés" in Salvador and "icaquillo" in Mexico. The bark is astringent, and that of some species of *Hirtella* has been used for tanning.

Hirtella guatemalensis Standl. *Pasta. Plate XXXVIII.* A shrub or small tree, sometimes 6 meters high; leaves nearly sessile, large, acute, densely soft-pubescent, especially beneath; flowers in long narrow panicles, the petals white, the three long stamens rose-purple; fruit nearly 2 cm. long, juicy, containing a single seed.—Frequent in wet thickets near the coast; known also from Guatemala and British Honduras. Called "pigeon-plum" in the latter country.

LICANIA Aubl.

Licania hypoleuca Benth. A large tree with slender twigs; leaves short-petioled, oblong to oblong-ovate, long-acuminate, thin, green and glabrous above, covered beneath with a dense close white tomentum; flowers small, greenish, panicled, the petals none or minute; fruit fleshy.—Noted only in swampy woods near Triunfo. Widely distributed in Atlantic Central America. Said to be called

"chozo" in Guatemala and some parts of Honduras, and to furnish wood for construction purposes. The wood is brownish gray with a yellowish tinge, very hard and heavy, of medium texture, hard to cut, and easy to split.

Licania platypus (Hemsl.) Fritsch. *Urraco.* A very large tree, with thick pale trunk and usually narrow crown of handsome dense foliage; leaves short-petioled, narrowly oblong, glabrous, rounded or short-pointed at the apex; flowers small, in large panicles; fruit fleshy, obovoid, 13 cm. long or larger, rough and brownish.—Common in swampy forests; widely distributed in Central America and in Mexico. Called "sunzapote" in the interior of Honduras; known in Salvador also as "sunza" and "súngano"; in Costa Rica as "zapote"; in Panama as "sangre"; and in Mexico as "mesonzapote," "zapote amarillo," "zapote borracho," and "zapote cabello." The tree is one of the finest and handsomest of those native in Central America. When in young foliage, with the unfolding leaves tinged with bronze, it is especially beautiful, and it makes a superior shade tree. The fruit requires about a year for ripening, and although edible it is little esteemed, especially because in some localities there is a belief that it causes fevers and other ailments. Its flesh is yellow, juicy, somewhat fibrous, and of slightly acid flavor. In British Honduras the tree is called "monkey-apple."

PRUNUS L.

Prunus Persica (L.) Sieb. & Zucc. *Durazno. Peach.* There is a good-sized peach tree growing at Puerto Arturo, but although it flowers freely, it never produces fruit. Peaches are seen frequently in the interior of Honduras, as well as in the mountains of Central America generally, but their fruit is nearly always small and of inferior quality.

CONNARACEAE. Connarus Family

The plants of this group are rather inconspicuous woody vines with alternate odd-pinnate leaves having narrow entire long-pointed leaflets. The small whitish flowers, in racemes or panicles, have 5 petals and 10 or fewer stamens. The fruit is a leathery or woody follicle, its single seed subtended by a fleshy aril.

CNESTIDIUM Planch.

Cnestidium rufescens Planch. A large woody vine; leaflets 7 to 13, oblong, acuminate, densely rusty-tomentose beneath; flowers

in rather large panicles; fruit 1–1.5 cm. long, densely brown-tomentose.—Common in swamps and thickets along the coast, and also extending inland; widely distributed in Central America.

CONNARUS L.

Connarus Popenoei Standl. A large woody vine, climbing over trees; leaflets 3, short-stalked, oblong or obovate-oblong, obtuse or short-pointed, glabrous, conspicuously veined; flowers in long panicled racemes, the panicles rusty-pubescent; fruit a lopsided follicle about 2 cm. long, conspicuously nerved, loosely rusty-tomentose.—Frequent in wet forest; known only from this region. Other species are widely distributed in Central America, although not very common.

ROUREA Aubl.

Rourea glabra HBK. A large, nearly glabrous, woody vine; leaflets usually 5, oblong to elliptic, long-acuminate, pale beneath, conspicuously veined; panicles few- or many-flowered, pubescent, the small petals white; fruit 1–1.7 cm. long, glabrous, the shining dark brown seed with an orange aril.—Frequent in wet forest or thickets; widely distributed in tropical America. Called "canjuro" in Salvador; "chililló" in Mexico. The tough stems are sometimes used as a substitute for rope. The seeds are believed to be very poisonous, and are used in some parts of Central America for destroying noxious animals. It is reported even that they have been used for criminal poisoning of human beings. The flesh of birds feeding upon the seeds is said to be poisonous to persons who may eat it.

LEGUMINOSAE. Bean Family

This is one of the largest families of plants, and it is well represented in Honduras as well as everywhere else in Central America. The plants are herbs, shrubs or trees, or often vines, frequently armed with prickles or spines. The leaves are generally alternate, nearly always compound, and usually provided with stipules. The flowers vary greatly in size and general appearance, but in most genera they resemble the flower of a bean or sweet pea, the normally 5 petals being very unlike, one of them (the *banner* or *standard*) being larger than the others, the two lateral ones (*wings*) being narrower, and the two lowest (*keel*) being often still smaller and frequently united. The sepals are united at the base or to the apex. The stamens are most commonly 10, but sometimes 5 or 9, and occasionally very numerous.

The fruit is a pod, often somewhat like a bean pod, but frequently greatly modified.

The family is divided into three large groups, which often are treated as separate families—the Mimosaceae, Caesalpiniaceae, and Fabaceae. These groups evidently are closely related and form a readily recognizable group; therefore it is perhaps preferable to treat them as subfamilies of one large group. They may be distinguished by the following characters:

I. *Mimoseae.* Flowers regular, the petals equal or nearly so. Petals valvate in bud, usually united below the middle. Stamens distinct or united. Leaves bipinnate, except in the genus *Inga.*

II. *Caesalpinieae.* Flowers irregular, the petals unequal. Petals imbricated in bud, the uppermost ones within the others. Stamens usually distinct. Leaves pinnate or bipinnate, rarely simple (as in *Bauhinia*).

III. *Papilionatae.* Flowers always papilionaceous (in the genera here listed), that is, resembling a bean flower. Petals imbricated in bud, the uppermost ones outside the others. Stamens 9 or 10, most frequently united into a sheath. Leaves never bipinnate.

I. MIMOSEAE (Mimosaceae)

ACACIA Willd.

The genus is well represented in Central America, but only two species were noted in the Tela region. They have bipinnate leaves provided with glands, and small flowers in heads or spikes. The stamens are very numerous.

Acacia Donnelliana Safford. *Carnezuelo, Iscanal. Bullhorn acacia.* A tree 4.5–9 meters high with a slender high trunk and a long narrow crown, armed with large hollow spines which somewhat resemble the horns of an ox; flowers in small dense globular heads.—Frequent in low thickets, especially along streams; known from Honduras and Guatemala. The determination of the Lancetilla specimens is uncertain because neither flowers nor fruits were obtainable during the time I spent in the region. The name "carnezuelo" used here evidently is a corruption of "cornezuelo."

The bullhorn acacias are plentiful in most parts of Central America, and they are among the most characteristic and curious plants of the region. It is difficult to find a plant whose large inflated spines are not inhabited by ants, although once in a great while one will find

an isolated individual which has been overlooked by the insects. While the spines are still young and tender they are punctured near the apex by the ants, and occupied, each spine being inhabited by a separate colony. The ants feed in part, at least, on nectar bodies borne upon the young leaves. They protect the plants efficiently against animals which might molest them, and sally forth full of fight when the branches are jarred by any passing body. They bite severely and painfully, and are perhaps the most ferocious of all the Central American ants, although there are others which are close competitors.

Acacia telensis Standl. A coarse shrub or a large woody vine, the branches densely beset with stout spreading broad-based prickles, the leaves provided with short recurved ones; pods large, flat, thin.—In wet thickets about Lancetilla; known only from this region.

ALBIZZIA Durazz.

Albizzia adinocephala (Donn. Smith) Britt. & Rose. A large tree, unarmed, nearly glabrous; leaves with 1–3 pairs of pinnae, the pinnae with 2–5 pairs of leaflets, these lanceolate to ovate, thin, 2–7 cm. long, pale beneath; flowers yellowish white, in dense heads, the corolla 9 mm. long; stamens numerous, united into a tube; pods thin and flat, 10–17 cm. long and 1.5–2 cm. wide, glabrous, the valves opening at maturity.—About Progreso, but not noted near Tela; ranging to Salvador and Panama. Called "gavilancillo" in Costa Rica, and in Salvador "conacaste blanco," "chaculaltapa," and "chapilte." The wood is brownish, moderately hard, strong, and coarse-textured.

CALLIANDRA Benth.

Shrubs or small trees, unarmed, the leaves twice pinnate, without glands; flowers in dense heads, the heads often arranged in racemes, the flowers frequently showy, especially because of the numerous long hairlike stamens; pods linear, flat, the two valves elastic at maturity and coiling backward when the pod opens.

Calliandra confusa Sprague & Riley. *Cabello de ángel.* A shrub 1.5–3 meters high, the stems usually not branched; leaves large, the very numerous linear leaflets 6–8 mm. long, acute; pods 8–10 cm. long or more, glabrous.—In thickets about Progreso; ranging from Costa Rica to southern Mexico. The large heads of purple-red stamens, arranged in long racemes, are very showy and pretty.

Calliandra tetragona (Willd.) Benth. A branched shrub or tree 3–5.5 meters high, often with a clean trunk, nearly glabrous; leaflets very numerous, oblong, obtuse, pale beneath; flower heads clustered in the leaf axils, the stamens long and white; pods glabrous, 10–12 cm. long.—In wet thickets about Tela, not common; distributed from southern Mexico to South America.

Calliandra yoroensis (Britton) Standl. (*Anneslia yoroensis* Britton.) A slender shrub or tree 2.5–4.5 meters high, glabrous; leaflets few, large, 2.5–5 cm. long, acute or acutish; flower heads mostly solitary in the leaf axils, the stamens white.—The species is known only from thickets at Progreso.

ENTADA Adans.

The Entadas are large woody vines, their leaves twice pinnate and composed of numerous large leaflets. The small greenish flowers, arranged in dense spikes, have 5 or 10 stamens. The pods at maturity break up into 1-seeded joints.

Entada gigas (L.) Fawc. & Rendle. (*E. scandens* Benth.) A large vine, climbing to the tops of tall trees, the stems compressed and twisted; leaves with 1–2 pairs of pinnae, each pinna with 4–5 pairs of oblong leaflets 2–8 cm. long, the leaf ending in a tendril; flowers greenish yellow; pods very large, usually 1–2 meters long, containing 10–12 seeds; seeds dark brown or blackish, compressed, smooth, 5–6 cm. broad.—Occasional in wet thickets or in swamps, especially near the coast; widely distributed in the tropics of both hemispheres. Called "javilla" in Costa Rica and Panama. The huge seeds are one of the kinds of so-called "sea-beans" most frequently found on seashores.

Entada polystachia (L.) DC. A large woody vine, nearly glabrous; pinnae 2–6 pairs, the leaflets 6–8 pairs, oblong to obovate, 2–4 cm. long, rounded at the apex, the leaves without tendrils; flowers greenish, the spikes in large panicles; pods flat and thin, 20–40 cm. long and 5–8 cm. wide, the seeds compressed, about 1 cm. broad.—Frequent in wet thickets near the coast; widely distributed in tropical America. Called "quiamol" and "cola de zorrillo" in Salvador; "parra rosa" in Costa Rica; and "bejuco de hierro" in Nicaragua.

INGA Scop.

The Ingas are characteristic trees of Central America, being represented by a large number of species, some of which occur in nearly all

regions except at very high elevations. They are mostly medium-sized, always unarmed trees, having once-pinnate leaves composed of few large leaflets. The large, white or greenish flowers, with long hairlike stamens, are arranged in spikes, racemes, or heads. The fruit is a large pod, very variable as to form, containing few large seeds which usually are surrounded by a whitish edible pulp. The pulp, juicy, sweet, and of good flavor, is much eaten, especially by children, and the pods often are offered for sale in the markets. The trees are considered the very best shade in coffee plantations, and are extensively planted for that purpose.

Inga edulis Mart. *Guama.* A tree 4.5–9 meters high with a broad depressed crown; leaflets 4–6 pairs, oblong to elliptic, mostly 15–20 cm. long, finely pubescent beneath, acuminate; leaf rachis winged; flowers pubescent, in short spikes; pods rounded or 4-angled, 20–30 cm. long or larger, densely pubescent, often twisted.—Common in thickets and wooded swamps; ranging from southern Mexico to Brazil. Called "pepetón" in Salvador, "guavo" in Panama, and "guayaniquil" in Costa Rica. The pods of this species contain edible pulp. The wood of this and other species is grayish to pinkish brown, moderately hard, and medium- to coarse-textured. It is not used except sometimes for firewood.

Inga multijuga Benth. *Guamo.* A tree 6 meters high; leaf rachis not winged; leaflets 5–10 pairs, oblong or lanceolate, densely pubescent beneath; flowers in short spikes.—Sterile material of a tree perhaps referable here was collected near the beach at Tela; the species ranges from Guatemala to Panama.

Inga Pittieri Micheli. A tree 9 meters high with spreading crown; leaf rachis broadly winged; leaflets 1–3 pairs, mostly 10–20 cm. long, densely pubescent beneath; flowers in short dense large-bracted spikes, the corollas pale green, 2 cm. long; pods 9–18 cm. long, 4-sided, glabrous, about 1.5 cm. thick.—In wet thickets; ranging to Panama.

Inga punctata Willd. *Cuajiniquil.* A tree 6–9 meters high with broad rounded crown; leaf rachis slender, not winged; leaflets 2–3 pairs, lanceolate to elliptic, acuminate, becoming glabrate, mostly 10–20 cm. long; flowers in short dense spikes, white, the corolla 5 mm. long; pods compressed, 10–12 cm. long, 2.5 cm. wide, often curved.—Common in thickets and pastures about Tela; distributed from Guatemala to Venezuela. Called "pepeto" and "pepeto negro" in Salvador.

Inga Roussoviana Pittier. A tree about 9 meters high with dense crown; leaf rachis not winged; leaflets 3–4 pairs, oblong or lanceolate, glabrous or nearly so; flowers in umbels, short-pediceled, white, the corolla 1 cm. long; pods flat, 12–17 cm. long.—Common in forests and pastures; ranging to Panama.

Inga spp. At least two species of *Inga* besides those listed above occur in the region, but since only sterile material of them was collected, it is impossible to be certain of their names.

MIMOSA L.

The Mimosas are herbs, shrubs, or small trees, often climbing, commonly armed with prickles. The leaves are twice pinnate, and usually have numerous (sometimes few) small leaflets. The flowers are small but often showy, arranged in heads or spikes, and have as many or twice as many stamens as corolla lobes. The normally flat pods break up at maturity into few or many joints.

Mimosa hondurana Britton. *Rabo de iguana.* A large woody vine, the branches armed with densely set, recurved, very sharp prickles; leaves with 2–4 pairs of pinnae, the leaflets 5–9 pairs, trapezoidal, acute, 1–3 cm. long, pubescent beneath; flowers white, in dense globose heads, these arranged in large panicles; pods thin, glabrous, unarmed.—Common in wet thickets; known only from the region of Tela and from Siguatepeque. About Lancetilla this plant forms dense impenetrable tangles, especially in second-growth, and it is a great pest when one is attempting to penetrate the jungle. The large panicles of flowers, when viewed from a safe distance, are showy and very handsome. I noticed that in the late winter of 1928 nearly all the plants came into flower upon the same day, bursting into full bloom all at once, but remaining in blossom for only a few days.

Mimosa invisa Mart. *Rabo de iguana.* A large coarse herb, the long stems 4–6-angled, armed with close-set recurved prickles; leaflets very numerous, oblong, 6–10 mm. long; flowers bright pink, in dense globose heads; pods 1–2.5 cm. long, densely prickly.—Frequent in wet thickets; widely distributed in tropical America. The long branches either spread over the ground or clamber over other plants. It is almost impossible to touch them without tearing the skin, because of the short clawlike prickles which catch hold of every object that approaches them. The plant is a great pest in cultivated ground. Strangely enough, it has been recommended as a

cover crop in tropical regions, and was planted for the purpose at Lancetilla, until its pernicious character was recognized. It was all too effective as a cover crop, and threatened to cover not only the ground but the very banana plants themselves.

Mimosa pigra L. *Carbón.* An erect shrub usually about 2 meters tall, armed on the branches and leaves with stout prickles; leaflets very numerous, linear, 5–8 mm. long; flowers pink, in dense spherical heads; pods 3–8 cm. long, about 1 cm. wide, densely bristly.—Common in open swampy places; widely distributed in the tropics of both hemispheres. Called "zarza" (bramble) in Salvador and Costa Rica; "dormilona" in Salvador; and "sinvergüenza" in Guatemala. A common and characteristic shrub of marshy places throughout Central America.

Mimosa pudica L. *Dormilona, Puta vieja. Sensitive plant.* A slender annual, erect or with prostrate branches, armed with slender prickles; pinnae 1 or 2 pairs, the numerous leaflets linear, 6–10 mm. long; flowers rose-pink, in small dense globose heads; pods 1–1.5 cm. long, 1 cm. wide, glabrous, long-bristly on margins.—A common weed in gardens and in waste places; widely distributed in tropical America. The stems sometimes clamber over other plants, but more commonly they spread over the ground. This is perhaps the best known of all the so-called sensitive plants. Whenever the plant is molested in any manner the leaflets fold together and droop, but in a short time they resume their normal position. They also close at night or during cloudy and rainy weather. Many other plants of the Mimoseae behave in the same manner.

Mimosa resinifera Britton. *Rabo de iguana.* A large woody vine, the branches armed with close-set recurved prickles; pinnae 2–3 pairs, the leaflets 2–3 pairs, rhombic, 1.5–5 cm. long, obtuse, resin-dotted beneath; flowers in dense globose heads, the stamens white.—Common in thickets; known only from the vicinity of Lancetilla. In habit this is much like *M. hondurana*, and an equal nuisance.

PITHECOLOBIUM Mart.

In Central America this genus is represented by a large number of species, which differ greatly as to the arrangement of their flowers and the form of the fruit. The group has been divided lately into several genera, but it is perhaps preferable to refer all the species to a single genus, at least until there has been made a convincing and thorough survey of all the species referred to *Pithecolobium*. Some

of the genera recently proposed seem to be based upon decidedly slight and unimportant characters. Certainly little weight can be attached by serious investigators to genera based upon the shape and size of leaflets.

The *Pithecolobium* species here listed have mostly small flowers with numerous stamens united below into a tube. The flowers are arranged in heads or spikes. The valves of the fruit usually are thickened and often curved or twisted. The plants composing the genus are either armed or unarmed.

Pithecolobium arboreum (L.) Urban. *Barba de jolote* (turkey beard). *Plate XXXIX.* An unarmed tree 9–18 meters high with broad open crown; leaves twice pinnate, the very numerous leaflets linear-oblong, 8–12 mm. long, glabrous; flowers greenish white, in long-stalked globose heads about 2.5 cm. in diameter; pods somewhat fleshy, slender, bright red, twisted, the large seeds black.—Frequent in thickets, forests, and pastures, often along streams; also in the West Indies, Mexico, and Central America generally.

Pithecolobium insigne Micheli. A tree 4.5–6 meters high, armed with sharp straight spines; leaflets 4, oblong-lanceolate, 8–12 cm. long, nearly glabrous, acuminate; flowers in long dense spikes, the long stamens white.—In thickets near Progreso; known only from Honduras. The tree is showy and handsome when in full flower.

Pithecolobium Johanseni Standl. (*P. telense* Britton.) A tree 6–9 meters high, armed with short sharp spines; leaflets 4, obovate, mostly 4–6 cm. long, rounded or very obtuse at the tip, nearly glabrous; flowers in dense short spikes arranged in a small panicle; pod very thick, curved, about 6 cm. long, not twisted, 1.5–2 cm. wide, roughened.—In wet thickets or especially in wooded swamps near the coast; the type was collected at La Ceiba, and the species is known only from the Honduran coast. The type of *P. telense* was collected near Tela. The pods are green, their pulp orange-red, juicy, and sweet.

Pithecolobium latifolium (L.) Benth. *Mayamaya.* An unarmed tree 6–11 meters high; pinnae 1 pair, leaflets usually 5 to each pinna, elliptic to oblong, acuminate, 7–15 cm. long, glabrous; flowers pink, in small heads borne on naked branches; pods flat, 10–30 cm. long, glabrous.—In wooded swamps and along streams close to the coast; ranging to Brazil; not reported north of Honduras.

Pithecolobium longifolium (H. & B.) Standl. *Mayamaya.* Similar to the preceding, but each pinna with only 3 leaflets; flowers in short spikes; pods 15–30 cm. long.—In wooded swamps and along streams near the coast; ranging to Colombia.

Pithecolobium Saman (Jacq.) Benth. *Raintree.* A huge tree with thick trunk and spreading, not very dense crown; pinnae 2–6 pairs, the leaflets 2–8 pairs, rhombic, mostly 2–4 cm. long, obtuse, usually pubescent beneath; flowers pinkish, in many-flowered umbels; pods fleshy, straight or slightly curved, thick, 10–20 cm. long.—In pastures about Tela; ranging to Brazil. Called "cenícero" in Salvador and Guatemala and "carreto" in Salvador. The wood of young trees is light, soft, easy to cut, and brown; that from old trees is hard, heavy, fibrous, cross-grained, hard to work, and deep chocolate-brown or nearly black. Cross sections of the large trunks are used in some regions of Central America for cart wheels. The pods, which contain a sweet pulp, are eaten by cattle. The leaflets are reported to fold together during cloudy weather, hence the name "raintree."

Pithecolobium tenellum (Britt. & Rose) Standl. A shrub or tree 2.5–6 meters high, unarmed; pinnae 3–4 pairs, the leaflets 8–10 pairs, oblong to lanceolate, mostly 2–4 cm. long, glabrous or finely pubescent; flowers white, in globose heads; pods 6–12 cm. long, bright red, fleshy, pendent, twisted, the seeds black.—Common in wet thickets and forests; also in British Honduras.

ENTEROLOBIUM Mart.

Enterolobium cyclocarpum (Jacq.) Griseb. *Guanacaste. Ear-tree.* A giant tree with thick trunk and very broad, spreading crown; leaves 2-pinnate, with very numerous linear leaflets about 1 cm. long and pale beneath; flowers white, with long stamens, in dense spherical heads; pods broad and flat, dark reddish-brown, coiled.—About Progreso; widely distributed in tropical America. The tree is easy to recognize by its fruit, which is coiled in such a way as to resemble a human ear. The trees often are left for shade in pastures, especially because stock eat the fallen pods and flowers. The wood is walnut-brown, very light and soft to moderately so, easy to work, and finishes smoothly. It is much used in Central America for general construction purposes and even for furniture, and some timber is imported into the United States. In Panama this species is called "corotú" and "curutú," but the usual name in Central America is "guanacaste," or variants of that Aztec word (meaning "ear tree"), such as "conacaste."

II. CAESALPINIEAE (Caesalpiniaceae)

BAUHINIA L.

The Bauhinias are easy to recognize by their leaves, which in most of the Central American species are cordate at the base and deeply 2-lobed (sometimes with 2 leaflets) from the apex. They are shrubs or small trees, sometimes climbing, with showy, white, pink, or yellow flowers arranged in racemes. The fruit is a flat pod which opens elastically.

Bauhinia divaricata L. An unarmed shrub about 1 meter high; leaves glabrous, deeply 2-lobed, about 10 cm. long, the lobes acutish, pale beneath; flowers white, the petals long and very narrow.—In pastures near Tela; ranging to Mexico and the West Indies.

Bauhinia sp. A large woody vine with deeply 2-lobed leaves.—Only sterile material was collected, in thickets near Lancetilla, and it has been impossible to determine the species.

CAESALPINIA L.

Caesalpinia pulcherrima (L.) Sw. *Guacamaya.* A shrub or small tree, often prickly; leaves bipinnate, with numerous small narrow leaflets; flowers large, red or yellow, with long-exserted stamens, arranged in racemes; fruit a compressed, elastically dehiscent pod.—Planted occasionally for ornament; native of tropical America. This is one of the most common ornamental shrubs of Central America, called in Panama "gallito," in Salvador "flor barbona" and "barbón," and in Costa Rica "clavellina." The English names are "Barbados pride," "flower fence," and "bird-of-paradise flower."

CASSIA L.

The genus *Cassia* is a very large one, represented in most tropical and subtropical regions of the earth. The plants vary greatly in habit and in the arrangement of their flowers. Their leaves have 2 to many pairs of leaflets; the flowers have 5 petals, usually yellow, and 5–10 stamens with erect anthers. The fruit varies greatly as to its structure and general appearance.

Cassia bacillaris L. A shrub or tree 2–6 meters high; leaflets 4, large, ovate to elliptic, acuminate, pale beneath and nearly glabrous; flowers large, yellow.—Wet thickets about Lancetilla; only sterile material was obtained, and the specific determination is uncertain. The species is widely distributed in tropical America.

Cassia biflora L. A shrub 1–1.5 meters high, nearly glabrous; leaflets about 14, oblong or obovate, 1.5–3 cm. long, pale beneath; flowers mostly axillary, very large and showy, bright yellow; pods linear, flat, dehiscent, 5–10 cm. long, 4–5 mm. wide.—In open fields about Progreso; widely distributed in tropical America. Known in Salvador as "carne asada," "caragüillo," "brasilillo," and "moco de gallo." Called "ahumada" and "montenegrito" in Nicaragua. A showy plant when in full blossom.

Cassia grandis L. f. *Carao.* A tree 12 meters high or more with broad open crown; leaves with numerous pairs of oblong leaflets 3–5 cm. long, these obtuse, densely pubescent beneath; flowers large, pink; pods round in cross section, 45–60 cm. long, about 3.5 cm. thick, filled with pulp and large seeds.—In pastures about Tela; widely distributed in tropical America. Called "cañafístula" in Panama; "carao" and "sandal" in Costa Rica; "carago," "caragua," and "caragüe" in Salvador. The pulp of the fruit has laxative properties, and in Central America it is used in domestic medicine. The brownish yellow, hard, and coarse-textured wood is little used. In British Honduras this tree is called "stinking-toe."

Cassia leiophylla Vog. A coarse erect herb 1–1.5 meters high; leaflets 3 pairs, oblong-obovate, rounded at the apex, 3.5–6 cm. long, pale and appressed-hairy beneath; flowers very large, deep yellow, borne in the leaf axils; pods linear, flat, 8–10 cm. long, 3–5 mm. wide.—A weed in thickets; widely distributed in tropical America. Known as "frijolillo" in Salvador.

Cassia occidentalis L. *Frijolillo.* An erect, often bushy-branched herb a meter high or less, glabrous; leaflets 3–4 pairs, ovate-oblong, acuminate; petiole with 2 conspicuous glands near its base; flowers showy, yellow; pods linear, flat, about 10 cm. long and 5 mm. wide.—A common weed in sandy places about Tela, and in thickets about Progreso; widely distributed in tropical America. Called "pico de pájaro" in Costa Rica, and "dandelion" by the West Indians of the Canal Zone. The plant is said to be employed medicinally in Honduras, although for just what purpose I was not informed. Here as elsewhere in Central America the seeds are sometimes employed as a substitute for coffee.

Cassia reticulata Willd. *Baraja, Barajo.* A coarse branching shrub or tree 3–6 meters high; leaflets numerous, oblong, densely pubescent, 8–10 cm. long or larger, rounded at the apex; flowers large, in long dense racemes, the sepals and bracts orange, the petals

bright yellow; pods flat, thin, 12–18 cm. long, 1.5–2 cm. wide, shining, with conspicuous cross lines.—Common in moist thickets or pastures, often in swampy soil; widely distributed in tropical America. Called "laureño" in Panama; "sambrán" and "barajillo" in Salvador; and "saragundín" in Costa Rica. In Honduras the root is used as a purgative and as a remedy for irregularities of menstruation. The plant is reported also to be poisonous. The shrub is abundant in many places in the Tela region, and when in full flower, in late winter, it is one of the most noticed trees of the lowlands. The flowering season is a very short one. The leaflets fold together in the evening and remain so until sunrise.

Cassia riparia HBK. An erect annual, often 1–1.5 meters tall, branched; leaflets numerous, oblong, sparingly pubescent, about 1.5 cm. long, bristle-tipped; petiole with a slender-stalked gland; flowers bright yellow, in the leaf axils; pods flat, about 4 cm. long and 5 mm. wide, pubescent, the valves opening elastically.—Common in thickets; widely distributed in Central and South America.

Cassia siamea Lam. A large shrub or small tree; leaflets about 7 pairs, oblong, rounded at the tip, about 4.5 cm. long, nearly glabrous; flowers yellow, large, in showy clusters; pods flat, about 17 cm. long, finely pubescent.—An Old World species planted at Lancetilla for ornament, and probably elsewhere in the region. It has been planted extensively for shade about the Canal Zone.

Cassia Wilsonii (Britt. & Rose) Standl. (*Chamaecrista Wilsonii* Britt. & Rose, ined.) Similar to *C. riparia;* low and bushy or often spreading or prostrate; leaflets fewer than in *C. riparia,* about 1 cm. long.—Common in sand along the beaches, also about Progreso.

CYNOMETRA L.

Cynometra retusa Britt. & Rose, ined. *Fruta de danto. Plate XL.* A tree 6–12 meters high; leaves very shortly stalked, the leaflets 2, oblong, very oblique, obtuse to acuminate, 7–10 cm. long, glabrous; flowers small, clustered in the leaf axils or on naked branches; young pods hairy.—Common in forests and along streams near the coast. The wood is said to be used only for charcoal.

DELONIX Raf.

Delonix regia (Bojer) Raf. *Guacamaya. Poinciana, Flame tree.* A medium-sized tree with spreading branches; leaves large and fern-like, bipinnate, with very numerous narrow leaflets; flowers flame-

red, in large inflorescences; fruit a large long narrow hard pod.—Planted for ornament; native of Madagascar, but grown generally in tropical regions. Usually called "árbol de fuego" or "flor de fuego" in Central America. When in flower, in spring, this tree is a gorgeous sight because of its great masses of brilliantly colored blossoms, but at other seasons it is an unattractive tree.

DIALIUM L.

Dialium divaricatum Vahl. *Paleta, Paleto.* Often a very large tree, with smooth bark and frequently with large thin buttresses; leaflets 5–7, thin, ovate, mostly 6–9 cm. long, with very long, tapering tips, obtuse or rounded at the base, glabrous or nearly so; flowers small, yellow, in large panicles; petal only one; stamens 2; fruit globose or ovoid, not opening, about 2 cm. long, 1-seeded.—Abundant in the forests; one of the two or three most common trees of the region, often forming almost pure stands, but usually mixed with *masica* (*Brosimum*). Called "tamarindo" in some parts of Honduras and "ironwood" in British Honduras. The wood is dark reddish brown, hard, heavy, strong, straight-grained, and rather fine-textured, resistant to decay, and takes a fine polish. It is used locally for fence posts, bridge timbers, and many other purposes, but it is said to be useless for charcoal. The fruits are a favorite food of peccaries and other animals.

SCHIZOLOBIUM Vog.

Schizolobium parahybum (Vell.) Blake. *Tambor, Zorra.* A tall tree, usually 15 meters high or more, with tall clean trunk and small crown, often provided with large buttresses; leaves very large, often a meter long, the very numerous leaflets oblong and about 2 cm. long, rounded at the tip, with minute appressed hairs beneath; flowers large, bright yellow, very showy; fruit a flat, broadly spatulate pod.—Frequent in forests and along streams; ranging from Guatemala to Brazil. Called "plumajillo" in some parts of Honduras; "chapulaltapa" in Salvador; and "quam" in British Honduras. The wood is nearly white, with brown streaks, very light and soft to moderately hard and tough, perishable, and not used. The tree is a beautiful one when in blossom, standing out prominently here and there over the hillsides. The young trees are particularly handsome, their trunks often simple although tall, or with only a few branches, which are terminated by huge clusters of leaves, suggesting the stems and crowns of some tree fern. The petioles are very sticky.

TAMARINDUS L.

Tamarindus indica L. *Tamarindo. Tamarind.* A medium-sized tree with pinnate leaves, the numerous leaflets oblong, obtuse, and 1–2 cm. long; flowers rather large, yellow striped with red, arranged in panicled racemes; pods 5–15 cm. long and 2 cm. broad, brown and indehiscent, containing 4–7 seeds.—Planted about Tela; native of the East Indies. The juicy red pulp surrounding the seeds has an agreeable flavor, and is much used for flavoring beverages and ices.

III. PAPILIONATAE (Fabaceae)

ZOLLERNIA Mart.

Zollernia tango Standl. *Tango.* A tall tree; leaves simple, short-petioled, glabrous, oblong or oblong-elliptic, mostly 10–12 cm. long, acuminate, remotely toothed; flowers in racemes at the ends of the branches; petals 5; stamens usually 10; fruit subglobose, about 2 cm. in diameter, 1-seeded.—Frequent on the forested hillsides; known also from British Honduras. The wood is of good quality, and is used locally for various purposes.

SWARTZIA Schreb.

Shrubs or trees, glabrous or nearly so; leaves with 1 or few entire leaflets; flowers showy, yellow, in short or long racemes; petal only 1 (the standard), broad; stamens numerous.

Swartzia darienensis Pittier. *Naranjillo.* A slender shrub or often a tree 5–7.5 meters high, glabrous; leaflet usually 1, the leaves appearing simple, short-stalked, leathery, oblong, acuminate, bright green, 8–15 cm. long; racemes mostly 2–5-flowered; pods terete, commonly 1-seeded, fleshy and about 2 cm. thick, turning yellow or red at maturity.—Frequent in wet mountain forests; ranging to Panama. This is probably only a form of the West Indian *S. simplex* (Sw.) Spreng.

Swartzia panamensis Benth. *Paterno.* A tree 12 meters high or larger, with dense rounded crown; leaflets 5, oblong to elliptic, thin, long-acuminate, 10–16 cm. long; flowers in very long racemes which hang beneath the branches, the flowers long-stalked; petals pale yellow; buds large, globose; pods flat, hard, 20–25 cm. long and 7–10 cm. wide.—Frequent in forests; ranging to Panama. The wood is reported to be of good quality, and it is used locally for posts.

ORMOSIA Jacks.

Ormosia coccinea (Aubl.) Jacks. A large tree; leaflets 7–9, oblong, pubescent beneath; flowers dark purple, in dense panicles; pods 1–4-seeded, about 2.5 cm. wide, deeply contracted between the seeds; seeds scarlet.—In wet hillside forest. Only imperfect material was obtainable, and there is much doubt concerning the specific determination.

CROTALARIA L. Rattlebox

The species here listed are annual herbs with simple or 3-foliolate leaves and short or long racemes of large yellow flowers. The pods are inflated, and the ripe seeds rattle about inside, hence the usual English name.

Crotalaria incana L. Plants much branched, rather densely hairy, usually about a meter high, or often lower; leaflets 3, rounded or obovate; flowers pale dull yellow, 1–1.4 cm. long; pods densely hairy, 3 cm. long.—A common weed in waste places; widely distributed in tropical America. Called "frijolillo" in Panama, and in Salvador "chinchín" and "chipilín."

Crotalaria retusa L. *Chinchín.* A coarse herb 1 meter tall or less; leaflet only 1, obovate or oblong-obovate, rounded at the apex, with minute appressed hairs beneath; flowers 2–2.5 cm. long, the petals yellow within, brown-red outside; pods 3 cm. long, glabrous.—A frequent weed, especially about Tela; widely distributed in tropical America. Known in Costa Rica as "gallincillo," "quiebra-plato," and "patillo."

INDIGOFERA L.

Herbs or small shrubs, the pubescence consisting of pale appressed hairs which are attached by their middle; leaves odd-pinnate, with numerous entire leaflets; flowers small, dull red, in short or long racemes; pods linear or nearly so, short or elongate, not compressed, not opening at maturity.

Indigofera mucronata Spreng. A large herb with long slender branches, spreading over the ground or sometimes as much as 2 meters long and clambering over shrubs; leaflets 5, oblong, thin, green, 1–3 cm. long; flowers 6 mm. long; pods many-seeded, straight, 2.5 cm. long.—Occasional about Tela and more plentiful at Progreso; widely distributed in tropical America. A weedy plant.

Indigofera suffruticosa Mill. *Jiquilite. Indigo.* A shrub usually about a meter high; leaflets 9–11, grayish; pods mostly 3–6-

seeded, thick, curved.—In thickets about Tela and Progreso; rare in the former region; widely distributed in tropical America. From this plant is obtained the indigo ("añil") of Central America, whose use as a dye was well known to the aboriginal inhabitants. Before the introduction of coffee, indigo growing was an important industry, but it is now cultivated only upon a small scale, and chiefly in Salvador. The dye is obtained by soaking the crushed plants in vats of water for some time, after which the coloring matter separates, its separation being hastened by tramping under foot. The process of extraction is a dangerous one for the persons engaged in it, and it is a blessing that the cultivation of the plant has been almost wholly discontinued.

BENTHAMANTHA Alef.

Benthamantha mollis (HBK.) Alef. A slender weak shrub 1–2 meters long, often reclining upon other plants; leaflets numerous, oval, 1.5–3 cm. long, rounded at the apex, densely silky-hairy; pods linear, compressed, about 8 cm. long and 4 mm. wide, minutely hairy, with impressed lines between the numerous seeds.—In thickets about Progreso; widely distributed in tropical America.

GLIRICIDIA HBK.

Gliricidia sepium (Jacq.) Steud. *Madriado, Madre de cacao, Madera negra.* A tree 4.5–9 meters high or sometimes larger, resembling an apple tree; leaflets 7–15, elliptic to oblong, acute or obtuse, 4–6 cm. long, usually blotched with purple beneath; flowers borne in racemes, pink, 2 cm. long; pods linear, flat, 10–15 cm. long and 1.5 cm. wide, glabrous.—Abundant; widely distributed in tropical America. Sometimes called "cacagua" in Honduras. Known in Panama as "bala," "balo," "madera negra," and "mata-ratón." In Salvador sometimes known as "palo de hierro." In Honduras, as well as generally in Central America, this tree is much planted for living fence posts. It is very showy when covered with its masses of delicately colored flowers, in late winter, but its abundance soon palls upon one. The name "madre de cacao" (cacao-mother) refers to the fact that in pre-conquest days the aborigines had learned that cacao thrived better in the shade of this tree than elsewhere, probably because of nitrogen-fixing bacteria inhabiting the roots. The wood is reddish brown, hard, heavy, tough, close-grained, and takes a good polish. It is very durable and is used for many purposes. It has the reputation in Central America of being almost incorruptible when in contact with the soil.

In Honduras the blossoms are said to be used as the basis for certain dulces, and they are also fried and eaten, being of good flavor when properly prepared. The leaves and seeds are employed for poisoning rats, mice, and other rodents.

ARACHIS L.

Arachis hypogaea L. *Cacahuate. Peanut.* Sometimes planted in the Tela region; native of Brazil. Peanuts are not common in the interior of Central America, but usually it is possible to obtain them along the Atlantic coast. The name "maní" often is applied to them.

AESCHYNOMENE L.

Much-branched herbs or shrubs; leaves pinnate, with very numerous small leaflets; flowers mostly axillary, small, yellow or dark reddish; pods small, narrow, often deeply notched along one edge, breaking up into numerous flat joints.

Aeschynomene americana L. A bushy herb a meter high or less, usually erect but sometimes spreading, the slender stems with stiff spreading hairs, leaflets linear-oblong, acute, about 5 mm. long; flowers 8 mm. long, buff or dull dark red; pods 2 cm. long, deeply notched along the lower edge.—Common in fields and thickets; widely distributed in tropical America. One of the most abundant weeds of Central America. Called "pegapega" in Panama, and "plumón" and "antejuela" in Salvador.

Aeschynomene sensitiva Sw. Erect, bushy-branched, herbaceous or somewhat woody near the base, sometimes 2 meters high, sparsely pubescent; leaflets obtuse or rounded at the tip; flowers greenish yellow; pods shallowly notched.—Common about Tela in open swampy ground or in wet fields; widely distributed in tropical America. The plants are eaten by cattle.

DESMODIUM Desv.

Weedy herbs; leaflets 3 in the species here listed, entire; flowers small, usually purple or pink, sometimes white, in racemes; fruit flat, composed of few or numerous 1-seeded joints which separate at maturity. The plants of this genus are often eaten by stock, and some of them are considered good forage plants in Central America and elsewhere.

Desmodium adscendens (Sw.) DC. *Mozote.* A coarse herb with reddish brown stems, or sometimes somewhat woody, the stems

occasionally as much as 1.5 meters long and clambering over other plants; leaflets 1–2.5 cm. long, rounded, usually almost as broad as long, rounded at the apex; flowers purple, 5 mm. long; pods pubescent, with about 4 joints, straight on the upper edge, notched on the lower, not twisted.—Common in thickets; widely distributed in tropical America.

Desmodium albiflorum Salzm. A slender, creeping or procumbent herb; leaflets thin, broadly ovate, mostly 3–6 cm. long, obtuse, paler and minutely puberulent beneath; flowers white or pinkish, in few-flowered, very lax racemes; pods with about 4 joints, straight on the upper edge, deeply notched on the lower.—A common weed in fields and thickets; a widely dispersed species of tropical America. In this, as in all the species, the joints of the pods adhere tenaciously to clothing and to the hair of animals by minute hooked hairs, and thus are distributed widely.

Desmodium frutescens (Jacq.) Schindl. *Mozote.* Stems 1–1.5 meters long, procumbent or often reclining on bushes; leaflets oblong to elliptic or ovate, 3–8 cm. long, obtuse or often acute, pale beneath and appressed-hairy; flowers pale purple, in long racemes; pods with several joints, straight along the upper edge, deeply notched along the lower.—A common weed of thickets, gardens, and waste places; one of the commonest weeds of tropical America. Called "pegapega" and "pegadera" in Panama, and by the West Indians of the Canal Zone, who use the plant medicinally, "strong-back."

Desmodium purpureum (Mill.) Fawc. & Rendle. *Mozote.* A coarse erect bushy herb about a meter high, sometimes somewhat woody; leaflets mostly ovate or oblong, obtuse, finely pubescent; flowers purple, in long panicled racemes; pods with numerous joints, deeply notched along both margins, often much twisted.—A common weed of fields and thickets; widely distributed in tropical America.

Desmodium Scorpiurus (Sw.) Desv. Plants procumbent, forming dense tangles or mats over the ground; leaflets oblong to ovate, obtuse, 1.5–3 cm. long, appressed-hairy beneath; flowers few, small, purple, in short racemes; pods with several joints, the joints about 3 times as long as broad (in the other species listed they are less than twice as long as broad).—An occasional weed; common in many parts of tropical America. Called "hierba de Santa Teresa" in Salvador.

Desmodium triflorum (L.) DC. Slender and creeping, forming dense close mats over the ground, the stems rooting all along the branches; leaflets rounded, about 5 mm. long; flowers pale purple,

clustered in the leaf axils; pods notched only on the lower edge.—In sand along the beaches and doubtless elsewhere; one of the common weeds of tropical America. Known in Salvador as "hierba cuartillo."

STYLOSANTHES Sw.

Stylosanthes humilis HBK. A prostrate annual herb, stiffly hairy and more or less viscid; stipules large and conspicuous; leaflets 3, linear-oblong, acute, hairy; flowers small, deep yellow, in dense clusters, sessile; pod 1–2-seeded, enclosed in the calyx, tipped with a coiled beak.—Gravelly fields near Progreso; widely distributed in tropical America.

ERYTHRINA L.

The Erythrinas are trees or large shrubs, often armed with stout prickles. The leaves have 3 large leaflets. In the large showy flowers, arranged in racemes, the standard petal is either much longer or else much broader than the other petals. The pods are linear, scarcely or not at all compressed, and more or less constricted between the large seeds.

Erythrina glauca Willd. A large tree, often with a short trunk and generally with a broad rounded crown; leaves often prickly, the leaflets thick, obtuse or rounded at the apex, pale beneath; flowers orange-colored, the standard broad, about 5 cm. wide.—Common in swamps toward Progreso but not noted near Tela; a common tree of the lowlands of Central America and extending to South America. Known in Panama as "pito," "gallito," "palo bobo," and "palo santo"; in Salvador as "ahuijote" or "ahuejote." The name "güiliqueme" is reported from Cuyamel, Honduras. The tree is a characteristic species of coastal swamps, in Panama often forming extensive, almost pure stands. The wood is brownish, light, soft, fibrous, and useless. The leaflets droop and assume a vertical position in the evening.

Erythrina hondurensis Standl. *Pito.* A prickly shrub or tree 3–6 meters high, with few thick branches and pale bark; leaflets thin, often broader than long, long-acuminate, pale and silky-hairy beneath; flowers red, the standard petal long and narrow, the others small; seeds bright red.—Frequent in wet thickets and forest, especially along small streams; known only from this region. The plant is a very showy one when in blossom, and the seeds also are handsome.

MUCUNA Adans.

Mucuna rostrata Benth. *Gallitos* (flowers), *Ojo de venado* (seeds). A large woody vine, climbing high over trees; leaflets 3, elliptic, acuminate, turning blackish when dried, silky-hairy or nearly glabrous beneath; flowers yellow, 7 cm. long, in short dense racemes hanging from the branches on long cordlike peduncles; keel petal larger than the others, ending in a curved hardened tip; pods large, few-seeded, covered with stiff sharp hairs.—Common in wooded swamps; widely distributed in tropical America. The hairs of the pods are very irritating when they penetrate the skin, as they do easily. The large marblelike seeds are softly colored so that they have some resemblance to deer's eyes, hence the Spanish name given to them. The seeds of this and other species are among the sea-beans often found on seashores.

RHYNCHOSIA Lour.

Rhynchosia pyramidalis (Lam.) Urban. A small or large vine, herbaceous or sometimes somewhat woody about the base; leaflets 3, ovate, acuminate, large, minutely pubescent and gland-dotted beneath; flowers small, greenish yellow, in long racemes, the corolla 6–7 mm. long; pods 8 mm. wide, 2-seeded, deeply constricted between the seeds; seeds scarlet and black.—Occasional in wet thickets; widely distributed in tropical America. Called "ojo de cangrejo" in Salvador (the seeds) and "huevos de casapulga." The name "pitillo" is reported from Honduras. The bright-colored and very pretty seeds are sometimes used as beads. They are reputed to be poisonous.

CAJANUS DC.

Cajanus bicolor DC. *Chícharo. Pigeon-pea.* An erect herb or shrub, often 2 meters high; leaflets 3, oblong or elliptic, acute, finely pubescent beneath; flowers yellow and red, arranged in short dense stalked racemes in the leaf axils; pods linear, 5–8 cm. long, 1 cm. wide, finely pubescent, the valves impressed between the seeds, which are whitish or gray.—Sparingly cultivated here; cultivated generally in tropical America, and often found as an escape. Probably a native of tropical Asia. Known in Panama as "guandú" and "frijol de palo" and among the West Indians as "goongo pea"; other names are "timbolillo," "quinbolillo," and "frijolillo" (Costa Rica); "cachito" (Guatemala); "alberga," "alverja" (Salvador). The plant is cultivated for its edible seeds, which are often eaten in Central America, especially by the West Indians.

PACHYRHIZUS Rich.

Pachyrhizus erosus (L.) Urban. *Jícama.* An herbaceous vine; leaflets 3, shallowly lobed or angled, silky-hairy beneath; flowers purple, in long axillary racemes.—Sometimes cultivated; native of Mexico. This plant is cultivated commonly in Central America for its roots, which resemble turnips in size and form, and have a sweet agreeable flavor. They are eaten raw.

CLITORIA L.

Slender herbaceous vines; leaves with 3–9 leaflets, these large and entire; flowers solitary or in short racemes, usually subtended by conspicuous nerved bractlets; standard petal very large and broad; pods linear, several-seeded.

Clitoria rubiginosa Juss. A small vine; leaflets 3, oblong to oval, obtuse or rounded at the apex, pubescent, paler beneath; flowers 4 cm. long, creamy white with purple markings; pods 3–4 cm. long and 8 mm. wide, thick, ridged along each valve.—In thickets about Tela; widely distributed in tropical America.

Clitoria Ternatea L. A large vine; leaflets 5–9, elliptic or broadly ovate, sparsely pubescent beneath; flowers of an intense deep blue, 4.5 cm. long; pods flat, 1 cm. wide, the valves not ridged.—Cultivated and sometimes found as an escape in fields and thickets; native of the Old World tropics. Called "campanilla" in Panama and "zapatillo de la reina" (queen's slipper) in Salvador. The flowers are very beautiful, and especially agreeable because of their unusual color.

CENTROSEMA DC.

Climbing herbs; leaflets 3, oblong or elliptic to ovate, acuminate or acute, sparsely pubescent or nearly glabrous; flowers large and showy, borne in the leaf axils, the standard large and broad; pods linear, with a long slender tip.

Centrosema Plumierii (Turp.) Benth. A large vine; leaves usually blackening when dried; upper calyx teeth shorter than the calyx tube; flowers about 4 cm. long, creamy white with dark purple center; pods long, about 1 cm. wide, 2-ridged on each side.—In wooded swamps about Tela; widely distributed in tropical America. Known in Salvador by the name "choncho."

Centrosema virginiana (L.) Benth. A small vine; leaves not blackening when dried; upper calyx teeth equaling or longer than

the tube; flowers nearly 3 cm. long, creamy white tinged with purple; pods mostly 5–7 mm. wide.—In thickets about Progreso; ranging northward to the United States.

CANAVALIA HBK.

Coarse herbs, climbing or trailing over the ground; leaflets 3, large; flowers large and showy, in stalked racemes in the leaf axils; pods often large, broadly linear, compressed and usually flat or nearly so.

Canavalia maritima (Aubl.) Thou. *Frijol del mar.* A large herbaceous vine, the stems trailing over the sand, often 10 meters long or more; leaflets large, rounded, thick, usually notched at the tip; flowers deep bright rose-color; pods about 10 cm. long and 2.5 cm. wide, with a sharp ridge close to the upper side.—Abundant on the beaches, and confined to such situations; widely distributed in tropical America. One of the characteristic strand plants of the American tropics.

Canavalia mexicana Piper. A large coarse herbaceous vine, climbing over shrubs; leaflets comparatively thin, acute or acuminate; flowers white or pink; pods about 20 cm. long and nearly 3 cm. wide. —In thickets about Progreso; ranging to Mexico.

DIOCLEA HBK.

Dioclea Wilsonii Standl. A large, more or less woody vine, the stems and leaves covered with stiff brown hairs; leaflets 3, oval or elliptic, large, rounded at the apex and often short-pointed; flowers large, purple, in long dense racemes bearing long linear spreading bracts which fall as the flowers open.—Occasional in wet thickets; known also from Guatemala.

CALOPOGONIUM Desv.

Small or large vines, usually herbaceous, abundantly pubescent; leaflets 3, large and broad; flowers purple, rather showy, in axillary racemes; pods linear, compressed.

Calopogonium brachycarpum Benth. A small herbaceous vine, trailing over the ground or over other herbs, densely brownish-hairy with stiff spreading hairs; leaflets ovate or rounded-ovate, acute or obtuse; racemes dense, headlike, shorter than the leaves, few-flowered; pods 4 mm. wide, hirsute.—A weed in fields and gardens; widely distributed in tropical America.

Calopogonium coeruleum Benth. A large vine, sometimes somewhat woody; leaflets acute or obtuse, densely soft-pubescent; racemes long, many-flowered, long-stalked, much longer than the leaves; pods 5–8 mm. wide, finely velvety-pubescent.—Frequent in thickets, climbing over shrubs; widely distributed in tropical America. A handsome plant when in blossom because of the profusion of bright purple flowers. Called "bejuco de lavar" in Salvador, the stems being used by laundresses for rubbing clothes, to take out the dirt.

GALACTIA P. Br.

Galactia tenuiflora (Willd.) Wight & Arn. A large herbaceous vine; leaflets 3, elliptic or ovate, mostly 6–9 cm. long, acute, appressed-pubescent beneath; flowers small, purple, in very long, slender, interrupted racemes.—In thickets near Progreso; ranging to South America. The specific determination of this plant is very uncertain.

PHASEOLUS L. Bean

Herbaceous vines, or sometimes erect herbs; leaflets 3; flowers often large and showy, in short or long racemes in the leaf axils; keel of the corolla spirally coiled.

Phaseolus adenanthus Mey. A large herbaceous vine; leaflets ovate or broadly ovate, acute or acuminate, sparsely pubescent or nearly glabrous; flowers purple and white, 2.5 cm. long.—Frequent in thickets; widely dispersed in tropical America.

Phaseolus aureus Roxb. *Mung bean.* An erect annual; leaflets broadly ovate, acute or acuminate, sparsely hairy; racemes few-flowered, the small flowers greenish yellow; pods about 5 mm. wide, the small seeds only 4 mm. long.—A weed in garden at Lancetilla; native of the Old World. This is the bean cultivated in China as a source of bean sprouts and gelatin.

Phaseolus hirsutus Mart. A large herbaceous vine, densely soft-pubescent or silky throughout; leaflets shallowly lobed, obtuse or acute; flowers bright yellow, 2.5 cm. long; pods densely hirsute.—In swampy thickets; ranging to South America.

Phaseolus lunatus L. *Frijol de mantequilla. Lima bean.* A large herbaceous vine; leaflets large, thin, nearly glabrous; flowers small, pale purple; pods flat, slightly curved, 1.5–2 cm. wide.—Occasional in thickets; widely distributed in tropical America. This wild plant is presumed to be the source of the cultivated lima beans, which have much larger pods and seeds than the wild plants. Lima

beans are grown only upon a small scale in Central America. The Spanish name used at Tela is a translation of the English "butter bean," and probably is of American inspiration.

Phaseolus peduncularis HBK. A small herbaceous vine; leaflets thin, oblong to ovate, acuminate, nearly glabrous; flowers purple or purplish, 1.5 cm. long; pods 3 mm. wide.—Frequent in thickets; widely distributed in tropical America.

Phaseolus vulgaris L. *Frijol. Kidney bean.* Widely grown in most regions of Honduras, and after corn the most important food staple of Central America. Many varieties of "frijoles" are recognized in Honduras, the usual and most popular forms having black or dark brown seeds.

VIGNA Savi

Herbaceous vines; leaflets 3, entire; racemes few-flowered, long-stalked in the leaf axils; keel of the corolla curved but not coiled; pods linear and nearly terete in cross section.

To this genus belongs the well-known cow-pea (*Vigna unguiculata*), which is sometimes cultivated in Central America.

Vigna repens (L.) Kuntze. *Frijol de playa.* A small vine, trailing over the ground; stems usually glabrous or nearly so; leaflets oblong to ovate; corolla 1.5 cm. long or shorter, yellow.—Common on sand along the beaches; widely distributed in tropical America.

Vigna vexillata (L.) A. Rich. *Frijol.* A small vine; stems usually with abundant stiff spreading brownish hairs; corolla 2–2.5 cm. long, purple and white.—A weed in fields and thickets; widely dispersed in tropical America. Called "choncho" in Salvador.

ANDIRA Lam.

Andira inermis HBK. *Almendro. Cabbage-bark.* A large tree with dense, dark green crown; leaflets opposite, 7–13, oblong, acuminate, glabrous, mostly 6–13 cm. long; flowers purple, 1–1.5 cm. long, in large dense panicles; fruit subglobose, woody, 2–4 cm. in diameter or larger, containing a single large seed.—Common in forests; widely distributed in tropical America. Called "cocú" in Panama. The bark has a nauseous odor and is used as a vermifuge, purgative, and narcotic, but in large doses it is said to be a dangerous poison. The seeds are reported to contain a poisonous alkaloid. The wood is reddish or brownish, with fine light-colored striping, very hard, heavy, strong, and durable, and takes a high polish. It is used for general construction, cart wheels, and many other purposes.

PLATYMISCIUM Vog.

Platymiscium dimorphandrum Donn. Smith. *Hormigo.* A large tree, 15 meters high or more, nearly glabrous; leaflets 3–5, large, acute or acuminate; leaves opposite; flowers small, yellow, in long racemes; pods oblong, thin, 1-seeded.—Common in forests; also in Guatemala. The tree is often inhabited by fierce ants, hence the Spanish name. There is much uncertainty regarding the species growing in the Tela region, because it has been impossible thus far to obtain good flowering or fruiting material. The wood of the *Platymiscium* species is reddish, hard and heavy, easy to work, and durable. It is used for general construction purposes and for furniture.

LONCHOCARPUS HBK.

Trees or large shrubs; leaflets few or numerous, opposite; flowers large and showy, pink or purple, in dense panicled racemes; fruit flat, oblong or linear, indehiscent. There are several species of this genus represented in the collections only by sterile material. The genus is a large one in Central America and, because of the lack of sufficiently ample material, the species are poorly understood. My own experience in the field proves that it is difficult to find the trees in either flower or fruit, especially the former.

Lonchocarpus hondurensis Benth. A tree 6–8 meters high; leaflets 5, glabrous, thick, ovate-oblong, acuminate, 4–10 cm. long; flowers red-purple, about 12 mm. long.—In swampy forests; ranging to southern Mexico.

Lonchocarpus latifolius (Willd.) HBK. *Cincho.* A tree, often 10 meters high or more; leaflets 5–9, oblong or ovate-oblong, 15–20 cm. long, acuminate, pubescent or glabrate, pale beneath; flowers about 1 cm. long; pods lanceolate, attenuate at each end, 4.5–6.5 cm. long, 2–2.5 cm. wide, 1–5-seeded, thin-edged.—Frequent in swamps; ranging from Guatemala to Panama. The wood is yellow, deepening to russet brown, hard, heavy, tough, strong, coarse-textured, and resistant to decay. It is used for heavy and durable construction.

Lonchocarpus Michelianus Pittier. *Cincho.* A small or large tree, said to be sometimes 30 meters high; leaflets about 9, thin, ovate to oblong, mostly 5–7 cm. long, densely grayish-pubescent beneath, acuminate; flowers purplish or pinkish, 1.5 cm. long.—Frequent in forests and wooded swamps; also in Guatemala.

Lonchocarpus monospermus Standl. A tree 4.5–9 meters high with dense crown; leaflets 7, oblong to obovate, mostly 8–11 cm.

long, abruptly acute, thick, pale beneath and nearly glabrous; pods 1-seeded, oval or rounded, about 2–2.5 cm. long and 2 cm. wide, nearly glabrous.—Wooded swamps about Tela; known only from this region.

DALBERGIA L. f.

The Dalbergias are shrubs or trees with alternate leaves. The leaves have 1 to numerous leaflets, in the former case appearing to be simple; when more than one they are alternate along the rachis. The small flowers are arranged in axillary racemes or panicles. The fruit is flat and thin and either short or elongate.

Dalbergia Brownei (Jacq.) Urban. A shrub 1.5–4.5 meters high, often with long pendent branches; leaflet 1, ovate or oblong-ovate, somewhat cordate at the base, obtuse, glabrous beneath or nearly so; pods 1–3-seeded.—In thickets along the beaches; widely distributed in tropical America.

Dalbergia cubilquitzensis (Donn. Smith) Pittier. *Granadillo. Rosewood. Plate XLI.* A tree 9–15 meters high or more; leaflets about 13, oblong to ovate, 4–7 cm. long, obtuse or rounded at the apex, thin, softly pubescent, at least when young; flowers creamy white, 4 mm. long, in dense cymes in the leaf axils.—Frequent in the forests; also in Guatemala. This tree furnishes a handsome reddish wood of excellent quality which is much used locally for making furniture and for construction purposes.

Dalbergia Ecastophyllum (L.) Taub. A shrub or tree 3–7.5 meters high, often forming dense thickets, the branches sometimes long and trailing over the ground; leaflet 1, oblong-ovate, obtuse or rounded at the base, 7–13 cm. long, acute or short-acuminate, thick, covered beneath with fine appressed hairs; flowers white, 8 mm. long, in short dense racemes; pods rounded, thin, 2–2.5 cm. wide, 1-seeded. —Common in thickets along the beaches and in tidal swamps; widely distributed in tropical America.

Dalbergia monetaria L. f. A shrub or small tree, glabrous; leaflets 3–5, oblong, abruptly short-acuminate, obtuse or rounded at the base; flowers in short dense racemes in the leaf axils; pods thin, glabrous, oval, slender-stalked.—In swampy forest near the coast; widely distributed in tropical America.

PTEROCARPUS L.

Pterocarpus belizensis Standl. *Sangre. Bloodwood.* A tall tree with slender trunk, thin and crooked buttresses, and smooth

bark containing blood-red sap; leaves large, the 7–9 leaflets alternate, oblong to ovate or lanceolate, 10–18 cm. long, with long abrupt narrow tips, glabrous or nearly so, acute to rounded at the base; fruits compressed, 1-seeded, rounded, with thin broad wings, 5–10 cm. broad.—Common in wooded swamps and also in hillside forests; extending to British Honduras. Sometimes forming almost pure stands in swampy ground. Wood dingy white, rather light and soft, medium-textured, easy to work, not durable. It is used locally only for fuel and charcoal. The fruits are borne in great abundance, and the water of the swamps sometimes is densely covered with them.

MACHAERIUM Pers.

The species are shrubs or trees, or often large woody vines. The leaves are alternate, and the leaflets also are inserted alternately on the rachis. The small, usually purple flowers are racemed and often form large panicles. The fruits are distinctive, resembling samaras, and compressed, the basal portion being 1-seeded but extended above into a large broad thin wing longer than the body of the fruit.

Machaerium latifolium (Benth.) Pittier. *Sangre* (probably an erroneous name). A large or medium-sized tree; leaflets about 5, elliptic or ovate, abruptly long-acuminate, obtuse or rounded at the base, nearly glabrous, blackening when dried, 8–16 cm. long; fruits about 6 cm. long, the wing 1.5 cm. wide, thin.—Common in forests; also in Guatemala and Salvador. The name "mata piojo" is reported from Honduras, and in Salvador the tree is called "chapulaltapa" and "palo de carreta." The wood is very hard, heavy, strong, and rather fine-textured, the sapwood yellow, the old heartwood purplish brown.

Machaerium marginatum Standl. A shrub or small tree, the young branches covered with long bristlelike hairs; leaflets about 11, oblong, 10–15 cm. long, leathery, nearly glabrous, with thickened margins; flowers purple, in large panicles.—In wet forest; ranging to Panama and southern Mexico. Called "sangre bravo" in Salvador.

Machaerium setulosum Pittier? A large or small woody vine, armed with recurved spines; leaflets very numerous, oblong, 1–2 cm. long, rounded at the tip.—Frequent in swamps and thickets. The species occurs in Guatemala. The specific determination of the Honduras specimens is very uncertain because no flowers or fruits could be found. It is probable that they represent an undescribed species.

Some of the species of the genus *Pelargonium*, known in English as geraniums and in Spanish by the name "geranio," are grown for ornament in Honduras. They are plants of African origin.

OXALIDACEAE. Wood Sorrel Family

OXALIS L.

The *Oxalis* species here listed are small herbs with long-petioled, alternate or basal, stipulate leaves composed of 3 broad entire leaflets. The flowers have 5 sepals, 5 delicate petals, and 10 stamens. The fruit is a columnar 5-celled capsule containing numerous small seeds.

Oxalis corniculata L. Plants creeping and rooting at the nodes, very slender; leaflets sparsely pilose, broadly notched at the apex; petals bright yellow.—A weed in garden at Lancetilla, doubtless a recent introduction; native of the Old World.

Oxalis intermedia A. Rich. Plants acaulescent, with a scaly bulblike rootstock; leaflets thick and fleshy, glabrous; petals rose-purple.—A weed in garden at Lancetilla; probably introduced from the Antilles. A relative of the violet sheep sorrel or wood sorrel of the United States.

Oxalis Neaei DC. Plants erect, 20–50 cm. high, often somewhat woody; leaflets ovate to lanceolate, appressed-pilose; petals yellow.—In open places, frequent; widely distributed in tropical America. Known in Salvador by the names "agrillo," "comino," "hierba de conejo," "jocotillo," "nancillo," and "tamarindillo." The flowers are open in the morning but close toward noon. The leaves are sometimes eaten.

RUTACEAE. Rue Family

The Honduran representatives of this family are aromatic trees which often are armed with prickles. The leaves are opposite or alternate, without stipules, compound, and dotted with transparent oil glands, a character by which the family may be recognized easily. The flowers are mostly small, with an inferior calyx composed of 3–5 lobes or sepals, and with 3–5 petals, the stamens being as many or twice as many as the petals. The ovary consists of 1–5 or more free or united carpels, the fruit being either dry or fleshy.

CITRUS L.

To this genus belong most of the citrus fruits commonly cultivated, all of which are natives of the Old World tropics.

Citrus aurantifolia (Christm.) Swingle. *Limón. Lime.* Planted and doubtless naturalized in some places about the region. Lime trees often are found in the forest in Central America, sometimes far from any human habitation. The acid fruits are much used for flavoring beverages, for making salads, and for preparing sweetmeats.

Citrus Aurantium L. *Naranja ácida. Sour orange.* Planted and naturalized in some places. The fruits are too sour to be eaten, and they are little used for any purpose.

Citrus grandis (L.) Osbeck. *Toronja. Grapefruit.* The grapefruit thrives in this region, and fruit of good quality is produced. The trees are little planted in Central America generally, because the native people do not like sour fruits.

Citrus Limonia Osbeck. *Limón real. Lemon.* Planted in a few places. Lemons are seldom seen in cultivation in Central America, limes being used in their place.

Citrus medica L. *Cidra. Citron.* The citron is planted infrequently in the Tela region, but it is seen commonly in many parts of Central America. The fruit is much like a grapefruit in general appearance. The very thick rind is used for the preparation of a delicious and handsome confection, called "dulce de toronja."

Citrus sinensis Osbeck. *Naranja, Naranja dulce. Sweet orange.* Planted frequently in the region, but only upon a very small scale. The orange is one of the favorite fruits of Central America, and the trees are planted everywhere. Although much of the fruit is of inferior quality because it is the product of seedling trees, oranges of the very finest quality are produced in many regions of Central America, and some areas, such as Navarro in Costa Rica, and the Oriente of Salvador, are famous for their sweet and deliciously flavored oranges, such as are not obtainable in the United States.

MURRAYA Koenig

Murraya paniculata (L.) Jack. (*M. exotica* L.) *Limonaria.* A shrub or small tree, the dark green leaves with 3–9 small obtuse leaflets, the flowers small and white; fruits red, 1–1.5 cm. long.—Planted about Tela for ornament; native of the East Indies. Called "mirto" and "jazmín de Arabia" in some parts of Central America.

RUTA L.

Ruta chalapensis L. *Ruda. Rue.* A strong-scented glabrous perennial herb with deeply lobed, glaucous leaves.—Planted occa-

sionally in gardens; native of the Mediterranean region. Rue is esteemed in Central America for its medicinal properties. The cultivated plants seldom or never bloom.

ZANTHOXYLUM L.

The local representatives of this genus are large trees whose trunks usually are copiously armed with stout hard conical prickles. The leaves are pinnate and have numerous gland-dotted leaflets. The flowers are small, greenish, and inconspicuous. The fruit is dry and composed of 1–5 small pods containing shining black seeds.

Zanthoxylum Kellermanii P. Wils. *Cedro espino.* A tall tree, the thick trunk covered with broad corky conelike prickles; leaflets large, about 6–8, oblong, abruptly acuminate, finely crenate, leathery, glabrous or nearly so; panicles many-flowered, appressed-hairy; fruit of 2–3 follicles about 6 mm. long.—Frequent in forests; extending to Salvador and British Honduras. Called "lagarto amarillo" in some parts of Honduras; "prickly yellow" in British Honduras. Wood yellowish, of moderate density, very coarse-textured. The crushed leaves have the odor of lemon.

Zanthoxylum procerum Donn. Smith. *Cedrillo.* A large tree; leaflets numerous, oblong, long-acuminate, slender-stalked, rounded and very oblique at the base, coarsely crenate; flowers in many-flowered terminal corymbs; follicle only one, 6–7 mm. long.—Frequent in mountain forests; extending from Costa Rica to southern Mexico. The large corky prickles found on the trunks of *Zanthoxylum* trees can be cut easily with a knife, and seals sometimes are cut on them. It is said that formerly the municipality seals in Honduras were made in this way. The name "concha de lagarto" is applied to some of the Honduran trees of the genus.

SIMARUBACEAE. Simaruba Family

PICRAMNIA Sw.

Picramnia latifolia Tul. A small slender tree or shrub; leaves with 5–7 large elliptic-ovate alternate leaflets; flowers small, white, in long slender pendent spikes; fruit fleshy.—Occasional in wet forest; extending to Panama and Colombia.

SIMARUBA Aubl.

Simaruba glauca DC. *Negrito.* A medium-sized or large tree; leaves alternate, pinnate, the 11 to 21 leaflets oblong, acutish,

glabrous or nearly so, very pale beneath; flowers small, greenish, in large panicles; fruit black or pinkish, 1.5–2 cm. long, resembling an olive.—Frequent in wet forest and in pastures; widely distributed in Central America. Called "aceituno" in Panama, Nicaragua, and Salvador, and "jucumico" in Salvador. The white pulp of the fruit is edible, although not of attractive flavor, and the fruits often are sold in the markets. An infusion of the bitter bark is employed in Costa Rica as a remedy for malaria. The tree is called "bitterwood" and "paradise tree" in Florida. Its wood is lustrous white, yellowish, or slightly brownish, light and soft, easy to work, weak, inodorous, and not durable.

To this family belongs the quassia tree (*Quassia amara* L.), which is common in many parts of Central America and probably occurs along the Atlantic coast of Honduras. It is noteworthy for its extremely bitter bark and foliage, which formerly was used like quinine in the treatment of malarial fevers.

BURSERACEAE. Torchwood Family

The Burseraceae are resinous trees with aromatic sap. The leaves are pinnate, usually deciduous, the leaflets narrow, entire, and long-pointed. The small, greenish white flowers are panicled and have 3–5 petals and twice as many stamens. The ovary is 3–5-celled, with 2 ovules in each cell, but some of the cells usually fail to develop, so that the capsular or somewhat fleshy fruit has fewer (often only one) cells.

BURSERA Jacq.

Bursera Simaruba (L.) Sarg. *Chinacuite, Indio desnudo. Gumbolimbo, Torchwood.* A small or large tree with thin, smooth, greenish or brownish bark which peels off in thin papery sheets; leaflets usually 5–7, glabrous or nearly so; flowers small, greenish or yellowish, in short axillary panicles; fruit dry, pointed, about 1 cm. long.—Common in forests and thickets; often planted for living fence posts. Called "almácigo" and "carate" in Panama; "jiñocuave," "caraña," and "jiñote" in Costa Rica; "jiote" in Salvador; "mulato" in Mexico. The names "chino" and "copón" are reported from Honduras.

This is one of the most common lowland trees of Central America, abundant on both slopes. When the trunk is cut there exudes a red aromatic sap, which soon hardens. The gum often is employed for mending broken dishes, and the Caribs sometimes coat their canoes with it, to protect them from worms and insects. Various medicinal

properties are ascribed to the tree. Its wood is whitish or light brown, light in weight, and too soft to be used except for fuel. It is said to be suitable for the manufacture of crates and packing boxes.

The name *indio desnudo* ("naked Indian") is a highly descriptive one, for the smooth copper-colored trunks, as one comes upon them in the deep forest, bear a startling resemblance to the bodies of Central American Indians seen bathing along the streams. Some of the trees of this species growing on the hills above Lancetilla are of huge size, much larger than is usual in Central America.

PROTIUM Burm.

Protium sessiliflorum (Rose) Standl. A large or medium-sized, nearly glabrous tree; leaves with 5–7 leaflets, these rather thin and usually acute at the base; flowers small, sessile, forming short panicles; fruit somewhat fleshy, green and red, 2.5 cm. long.—Frequent in the hill forests; ranging from British Honduras to Panama. Called "anime," "comida de mono," and "chutras" in Panama; "tontol" in Guatemala; "copal" and "copal macho" in British Honduras. The wood is tan or pinkish, rather light but fairly hard, with wavy grain.

TETRAGASTRIS Gaertn.

Tetragastris Stevensonii Standl. A large glabrous tree; leaves with usually 7 leaflets, these thick and leathery; flowers small, in short dense panicles; fruit somewhat fleshy, broader than long, about 2 cm. broad.—Common in hill forests; ranging to British Honduras and Nicaragua. Called "carbón" in British Honduras.

In Mexico the gum from trees of this family is gathered in large amounts, for use in the manufacture of varnish. This copal often is burned as incense in the churches, and it is known to have been employed long ago as incense in the pagan temples.

MELIACEAE. Mahogany Family

The family consists of trees and shrubs, some of which are of great economic importance. They have alternate, normally pinnate leaves, without stipules. The mostly small and inconspicuous flowers have a 4–5-lobed calyx, 4 or 5 petals, and 5, 8, or 10 stamens. The fruit is either a capsule or a drupe.

CARAPA Aubl.

Carapa guianensis Aubl. *Crabwood.* A large tree; leaves very large, the 10–14 or more leaflets oblong, acute, 15–30 cm. long or

larger, glabrous, leathery; flowers in axillary panicles, with 4 sepals, the 4 petals 5 mm. long; fruit a woody 4-angled capsule 7–10 cm. broad.—Occasional in swamps near the coast; extending to the West Indies and South America. The determination of the Honduran specimens is uncertain because of the lack of complete material. The seeds are rich in oil, used in South America for making soap and for illuminating purposes. The wood is reddish brown, rather hard and compact, mostly straight-grained, rather coarse-textured, works readily, finishes smoothly, and is durable. In British Guiana it is used extensively for general construction and for furniture.

CEDRELA L.

Cedrela mexicana Roem. *Cedro. Spanish cedar.* A very large tree with narrow thick buttresses; leaves large, pinnate, the 10–30 leaflets thin, short-stalked, oblong or lanceolate, entire; flowers greenish, in large panicles, the petals 5–6 mm. long; capsules ellipsoid, 4 cm. long, the seeds winged.—Common in forests; widely distributed in tropical America. Spanish cedar is one of the best-known trees of tropical America because of its valuable wood, which is reddish, fragrant, light and soft, very easy to work, and resistant to the attacks of insects. It is used in large quantities in the United States for the manufacture of cigar boxes, being the only wood that is considered satisfactory for this purpose. In Central America it is used very extensively for general construction purposes and for the manufacture of furniture. In Honduras cayucos, or dugout canoes, are made from it. The tree has, of course, no relationship to the true cedars of the genera *Cedrus* and *Juniperus* of the Coniferae, but it derived its Spanish and also its English names because of its similarity in color and odor to the woods of those genera.

GUAREA Allem.

The Guareas are trees or large shrubs, their leaves with few or numerous entire leaflets. The flowers are small and greenish, in mostly axillary panicles, the calyx 4–5-toothed, the corolla of 4 or 5 petals. The 8 or 10 anthers are borne on the inside of the apex of the stamen tube. The fruit is a 3–5-celled capsule, with 1 or 2 seeds in each cell, each seed enclosed in an aril.

Guarea bijuga C. DC. Usually a shrub about 2 meters high; leaflets 4, elliptic, 8–10 cm. wide, acuminate, glabrous; inflorescences short and dense, appressed-hairy; petals 6–7 mm. long; capsules 2 cm. broad or larger, bright red.—Frequent in deep forest on the hills

high above Lancetilla; also in Guatemala. The plant is remarkable for its small size, flowering and fruiting when only a low shrub. It may well be that it does sometimes attain the height of a tree. The determination of the Honduran specimens is not altogether certain.

Guarea excelsa HBK. *Carbón.* A large tree, sometimes attaining a great height, the crown broad and dense; leaflets 4–6 or more, mostly oblong, 3–7 cm. wide, obtuse or short-pointed, bearded beneath in the axils of the veins, otherwise glabrous; panicles small, many-flowered, appressed-hairy; petals 4, mostly 4–5 mm. long; capsules subglobose, about 2 cm. broad.—Common in forests; widely dispersed in Mexico and Central America. The wood is pale reddish, of medium density and weight, rather coarse-textured, and fairly durable. It is much used locally for general construction purposes, and is utilized also for charcoal.

MELIA L.

Melia Azedarach L. *Paraíso. Chinaberry.* A small tree with twice-pinnate leaves, the small leaflets coarsely toothed; flowers showy, fragrant, the petals lavender, the stamen tube dark purple; fruit a large translucent drupe.—Planted frequently for ornament and for living fence posts, and in some places tending to become naturalized; native of southeastern Asia, but cultivated generally in tropical and subtropical regions. Called "jacinto" in Panama and "lila" (lilac) in some parts of Central America. The latter name is a good one, for the flowers suggest lilacs in both their color and fragrance. The tree is not very satisfactory for shade because it is short-lived, and the branches are easily broken by the wind and other agents. The wood is reddish, light, soft, and weak.

SWIETENIA Jacq.

Swietenia macrophylla King. *Caoba, Majaine* (a corruption of the word mahogany). *Mahogany.* A large tree; leaves large, shining, pinnate, the 8–12 leaflets lanceolate, unequal, acuminate, 7–15 cm. long or more, glabrous, entire; flowers small, whitish, in panicles in the leaf axils, the petals 5–6 mm. long; capsules ovoid, 12–15 cm. long, acutish, splitting into 5 valves and freeing the large winged seeds.—Occasional in the forests; ranging from southern Mexico to Colombia and perhaps farther southward. The wood is the most famous produced in tropical America, being used as a standard by which the quality of other fine woods is judged. It has long been in demand for beautiful furniture, and vast amounts have been exported

to Europe and North America for hundreds of years. In Honduras the tree extends up to an elevation of about 600 meters.

One other species of mahogany grows in Central America, *Swietenia humilis* Zucc., which is distributed along the Pacific coast, where it grows in comparatively dry places. The mahogany first discovered was the Cuban species, *S. Mahagoni*, which is confined to the West Indies and southern Florida. In Venezuela there is another species, *S. Candollei*, related to the Honduran species. Still another species, *S. Tessmannii*, described recently from eastern Peru, is closely related to *S. macrophylla*, and probably only a form of it.

TRICHILIA L.

The Trichilias are trees or large shrubs, their leaves usually pinnate but sometimes reduced to a single leaflet. The small, greenish or yellowish flowers are panicled, and have 4 or 5 petals. The 4–10 anthers are borne on the apex of the stamen tube or its lobes. The fruit is normally a small, 3-valved, 3-seeded capsule, which splits open and exposes the single seed in each cell, surrounded by a usually red and showy aril.

Trichilia breviflora Blake & Standl. A shrub or small tree 3–4.5 meters tall; leaflet only one, oblong or obovate-oblong, 8–11 cm. long, short-acuminate, finely pubescent or nearly glabrous; flowers very small, white, in small, laxly flowered panicles.—Occasional in thickets; known only from this region.

Trichilia havanensis Jacq. *Limoncillo.* A shrub or tree 3–9 meters high; leaves pinnate, the leaflets mostly 5, obovate or oblong, obtuse, wedge-shaped at the base, shining, the rachis of the leaf narrowly winged; flowers small, green or whitish, in axillary clusters. —Frequent in thickets about Tela and Progreso; widely distributed in tropical America. The name "zopilote" was given me at Siguatepeque for the tree, but I suspect that it is an erroneous one. In some parts of Honduras the tree is called "barrehorno." In Salvador the names "barredero" and "ojo de muñeca" are applied to it. The wood is brownish, rather light and soft, straight-grained, fairly fine-textured, easy to work, and not durable.

MALPIGHIACEAE. Malpighia Family

The plants of this family, at least as it is represented in Central America, are mostly uninteresting, although some of them are showy because of their rather large and brightly colored flowers. They are

trees or shrubs, or often woody vines, with opposite, entire or lobed leaves which frequently bear glands on the petiole or on the lower surface of the blade. The pubescence in most species is characteristic, consisting of glistening appressed hairs which are attached by their middle. The 5 sepals normally bear glands on their outer surface. The 5 petals are commonly either yellow or purplish, with broad blades borne on narrow claws, and the blades in many species are fringed or toothed.

BUNCHOSIA Rich.

The Bunchosias are erect shrubs or small trees with short-petioled entire leaves. The yellow flowers are arranged in racemes or small panicles in the axils of the leaves. The fruit is a red or orange drupe which is 2–3-lobed.

Bunchosia cornifolia HBK. A shrub or tree sometimes 7.5 meters high; leaves large, oval or elliptic, 16–35 cm. long and 7–20 cm. wide, rounded to acute at the apex, obtuse or rounded at the base, thin, densely covered beneath with closely appressed, glistening, grayish hairs; fruit bright red, about 1.5 cm. in diameter.—Occasional in wooded swamps and along streams; ranging southward to Colombia. Called "cerezo" and "cerezo de monte" in Panama.

Bunchosia nitida (Jacq.) DC. A shrub or tree 4.5–6 meters high; leaves oblong or elliptic-oblong, 7–14 cm. long, long-acuminate, acute at the base, thick, nearly glabrous; fruit scarlet, 1 cm. in diameter.—In wooded swamps near the coast; also in Yucatan and the West Indies.

BYRSONIMA Rich.

Byrsonima crassifolia (L.) DC. *Nance.* A shrub or tree 3–6 meters high with stout branches; leaves oblong to obovate, 7–12 cm. long, acute at each end, thick, densely grayish- or brownish-tomentose beneath or in age nearly glabrous; flowers in terminal racemes, the showy petals yellow, turning reddish in age; fruit a globose yellow drupe 1 cm. in diameter.—Abundant in thickets along the beach near Tela, but not noted elsewhere; widely distributed in tropical America. Sometimes called "nancite" in Salvador and Costa Rica, but "nance" is the current name in Central America. The ripe fruits are good to eat, having a flavor that reminds one of green apples. They are eaten mostly by children, and only rarely are offered for sale in the markets. The wood is dull reddish or pinkish brown, rather hard, and heavy, strong, and brittle. It is little used, and probably not at all along the coast of Honduras

unless for firewood. In some parts of the Pacific slope of Central America this tree forms extensive and almost pure stands of characteristic appearance, often in association with guavas. In the British West Indies the name "golden spoon" sometimes is applied to it.

HETEROPTERIS HBK.

Heteropteris laurifolia (L.) Juss. A large woody vine; leaves short-petioled, oblong, 12–22 cm. long, thick and leathery, acute or short-acuminate, glabrous or nearly so, often shining; flowers large, yellow, in broad terminal panicles, the branches densely rusty-tomentose; fruit of 2 or 3 large samaras whose wings are thickened on the outer margin.—In wooded swamps near the coast; widely distributed in tropical America. Called "cointura" in Panama and "coral" in Costa Rica. The vine is a showy one when in full blossom.

HIRAEA Jacq.

Hiraea obovata Niedenzu. An erect shrub; leaves on very short petioles, obovate, obtuse or rounded at the apex, narrowed to the shallowly cordate base, pubescent beneath with spreading hairs; flowers yellow; fruit of 3 samaras with distinct lateral wings and with dorsal crests.—In thickets near Progreso; ranging to Panama.

MALPIGHIA L.

Malpighia glabra L. A shrub or small tree, 1–6 meters high, nearly glabrous but with a few appressed hairs; leaves short-petioled, oblong to elliptic, mostly 4–7 cm. long but sometimes larger, acute or acuminate at each end; flowers small, pink, in axillary cymes; fruit a globose red drupe 1–1.5 cm. in diameter.—Frequent in thickets and swamps near the coast; widely distributed in tropical America. The fruit is acid and edible. The plant is called "cerezo" in Panama and "camaroncito" in Salvador.

STIGMAPHYLLON Juss.

Stigmaphyllon Lindenianum Juss. A large or small, woody vine; leaves long-stalked, broadly ovate and entire or often deeply lobed, frequently cordate at the base, covered beneath with pale, closely appressed, silky hairs; flowers large and yellow, in dense panicled clusters; fruit of about 3 samaras, their wings thickened along the inner side.—Common in thickets; widely distributed in Mexico and Central America.

VOCHYSIACEAE. Vochysia Family

VOCHYSIA [Aubl.] Juss.

Vochysia hondurensis Sprague. *San Juan.* A large forest tree, often 15–25 meters high, with white weak wood, the trunk usually long and slender and much longer than the crown, the bark smooth and pale; leaves in whorls of 3–4, short-petioled, oblong or oblanceolate-oblong, 8–14 cm. long, rounded to acute at the apex, glabrous; flowers bright yellow, in narrow dense panicles at the tips of the branches and in the axils of the leaves; sepals 5, one of them produced as a spur; petals 3, obovate, 5 mm. long; fruit a 3-angled and 3-celled capsule 4 cm. long.—Common in forests; ranging to Costa Rica and British Honduras, near the Atlantic coast. The tree is a conspicuous and handsome one when in flower in late spring.

POLYGALACEAE. Polygala Family

The plants of this family are very diverse as to habit, but all have entire leaves, without stipules. The flowers are perfect and irregular, with 5 inferior sepals, of which the 2 lateral ones often are large and colored. There are usually 3 petals, which are more or less united, and normally 8 stamens.

POLYGALA L.

Polygala paniculata L. A slender erect annual with wiry stems; leaves linear, alternate; flowers only 2 mm. long, white or rose-purple, in long slender racemes.—In sandy thickets near the beach, apparently scarce in this region; widely distributed in tropical America.

Several other species of the genus are known from the interior of Honduras.

SECURIDACA L.

Securidaca diversifolia (L.) Blake. A woody vine with slender branches; leaves alternate, nearly sessile, ovate to oblong, acute, reticulate-veined, the pubescence of minute appressed hairs; flowers in racemes, showy, bright pink, suggesting those of some legumes; fruit a large samara 4–7 cm. long.—Occasional in forest or thickets; widely distributed in tropical America. Known in Salvador by the names "tamagás" and "bejuco de purgación."

EUPHORBIACEAE. Spurge Family

The Euphorbiaceae form one of the largest families of Central American plants. The group is a heterogeneous one as regards habit

and general appearance, but most of the plants have milky sap, alternate leaves, flowers of separate sexes, and a fruit consisting of a 3-celled capsule, although all of these characters have exceptions. The pubescence often consists of scales or of branched hairs.

To this family belongs the Pará rubber tree (*Hevea*), a native of Brazil but now grown extensively in the East Indies as the chief source of the world's supply of rubber.

ACALYPHA L.

Herbs, shrubs, or small trees with usually toothed leaves; flowers of two sexes, the two kinds usually borne upon the same plant; pistillate flowers mostly in elongate spikes, the flowers subtended by conspicuous, sessile, green, usually toothed bracts; staminate flowers commonly in long slender catkinlike spikes; fruit a small 3-celled capsule. The genus is represented in Central America by a large number of species of unattractive aspect and of little general interest.

Acalypha arvensis Poepp. & Endl. A perennial herb 30–60 cm. high, usually much branched, the stems pubescent or hirsute; leaves long-petioled, broadly ovate or rhombic, acute or obtuse, obtuse at the base, closely crenate; pistillate spikes oblong, very dense, 1.5–3 cm. long, densely hairy, usually with a small stalked staminate portion.—A frequent weed in fields and thickets; ranging from Mexico to South America. Known in Salvador by the names "gusanillo," "tarco," and "taba de pollo."

Acalypha costaricensis (Kuntze) Knobl. *Plate XLII.* A slender shrub 1–2 meters high, or sometimes almost wholly herbaceous, simple or with a few branches; leaves large, elliptic-oblong to ovate, often broadest above the middle, thin, nearly glabrous, coarsely and irregularly toothed; staminate flowers in very long and slender, green or red spikes; pistillate flowers pediceled, arranged in large lax terminal panicles; styles bright red; capsules covered with slender spinelike tubercles.—Common in wet thickets and thin forest, often a weed in clearings; ranging to Guatemala and Costa Rica.

Acalypha diversifolia Jacq. *Costilla de danto.* A slender shrub or tree 2.5–9 meters high, the trunk sometimes 12 cm. in diameter; leaves rather short-petioled, lance-oblong to oblong-elliptic, long-acuminate, mostly 8–12 cm. long, obtuse at the base, crenate-serrate, finely pubescent or nearly glabrous; both kinds of flowers in slender catkinlike spikes.—Common in thickets; one of the common shrubs of

Central America, and widely distributed in tropical America. The wood is yellowish brown, compact, and fine-textured, but it is not used unless sometimes for firewood.

Acalypha Ferdinandi Hoffm. *Costilla de danto.* A slender shrub 1.5–4.5 meters high, the branches glabrous; leaves short-petioled, oblong, obovate-oblong, or oblanceolate-oblong, mostly 9–12 cm. long, narrowly long-acuminate, cuneately narrowed toward the base, the base itself obtuse or cordate, glabrous, shallowly serrate; staminate spikes axillary, slender, green or reddish; pistillate spikes terminal, the bracts remote, tinged with red, with 13–15 slender teeth.—Common in wet forest and thickets; distributed from Guatemala to Costa Rica. When growing in wet shaded places the branches often produce numerous long slender aerial roots.

Acalypha lancetillae Standl. A slender shrub 2.5–3.5 meters high, the branches densely soft-pubescent; leaves short-petioled, oblong or obovate-oblong, acuminate, obtuse at the base, inconspicuously serrate, densely velvety-pubescent beneath; staminate spikes borne in the leaf axils, long and slender; pistillate bracts solitary in the leaf axils.—In deep forest high on the hills above Lancetilla; known only from this vicinity.

Acalypha macrostachya Jacq. A coarse shrub 2.5–4.5 meters high; leaves long-petioled, broadly ovate, mostly 15–25 cm. long, acuminate, broadly rounded at the base, crenate or serrate, densely soft-pubescent; spikes of both sexes axillary, often much elongate and up to 40 cm. long.—Common in wet thickets; widely distributed in tropical America. Called "shuampa" in Salvador.

Acalypha Poiretii Spreng. An annual 30–60 cm. high, much branched above, densely pubescent; leaves long-petioled, broadly ovate, acute or acuminate, rounded or subcordate at the base, coarsely crenate; spikes terminal and axillary, the pistillate oblong, 1–3 cm. long, very dense, with a slender short staminate portion at the tip, densely hairy.—Occasional in fields and on open banks; not noted very near Lancetilla; ranging from Mexico to South America.

Acalypha setosa A. Rich. An annual 30–60 cm. high or larger, finely pubescent; leaves long-petioled, broadly ovate, mostly 5–8 cm. long, acuminate, rounded at the base, finely crenate-serrate; staminate spikes axillary, about 1 cm. long, the pistillate terminal, 3–6 cm. long, dense, green; capsule pilose.—A frequent weed in moist thickets and fields and on open banks; widely distributed in tropical America. Called "gusanillo" and "tarco" in Salvador.

Acalypha villosa Jacq. A slender shrub 2 meters high; leaves long-petioled, broadly ovate, 10–18 cm. long, acuminate, rounded at the base, densely soft-pubescent beneath; staminate spikes axillary, dense, long and slender; pistillate flowers pediceled, arranged usually in large slender panicles; capsule covered with short spinelike tubercles.—In thickets about Progreso; widely distributed in tropical America.

Acalypha Wilkesiana Muell. Arg. A shrub, the broad leaves reddish or purplish or often spotted with white or pink.—Planted for ornament; native of the Pacific islands. Called "manto de Jesús" in Salvador and "primavera" in Nicaragua. This is one of the most common ornamental shrubs of Central America.

ALCHORNEA Sw.

Alchornea latifolia Sw. A small or medium-sized tree, commonly about 9 meters high but often larger; leaves long-stalked, broadly ovate to elliptic-oblong, 12–18 cm. long, acute or acuminate, obtuse to cordate at the base, thick, coarsely toothed, glabrous or nearly so, 3-nerved at the base; flowers of the two sexes on separate trees, the staminate flowers arranged in large pubescent panicles.—Frequent, especially along streams near the coast; widely distributed in tropical America. The name "canelito" is reported from Cuyámel, Honduras. The wood is brown, rather light and soft, and medium-textured.

CODIAEUM Juss.

Codiaeum variegatum (L.) Blume. *Laurel.* A dense shrub, the leaves varying from obovate to linear and colored or variegated with green, red, pink, yellow, and white.—Planted commonly for ornament; native of the Pacific islands. The plants are usually called crotons. They vary extraordinarily in the form and coloring of their leaves, and they are favorite ornamental shrubs everywhere in Central America.

CROTON L.

The genus consists of herbs, shrubs, or trees with alternate, often heart-shaped leaves, the pubescence mostly of scales or stellate hairs. The greenish or whitish flowers are arranged in racemes, the pistillate flowers near the base of the raceme, the staminate above. The fruit is a 3-lobed capsule.

Croton ciliato-glandulosus Ortega. *Ciega-ojo.* A shrub about a meter high with aromatic odor; leaves long-petioled, broadly ovate

and usually cordate at the base, acuminate, densely stellate-pubescent, the margin usually with a row of long gland-tipped hairs.—Frequent in thickets about Progreso, also in the mountains of the interior; ranging to Mexico and also in Cuba, but not known south of Honduras. The glandular hairs which abound upon the plant stick to the hands if the plant is touched, and they are said to be very injurious to the eyes if introduced into them, hence the vernacular name. The names "chirca" and "ciega vista" are sometimes applied to the shrub in Guatemala and Honduras.

Croton glabellus L. *Cascarilián, Lián. Plate XLIII.* An aromatic shrub or tree 3–9 meters high, the pubescence of minute rusty scales; leaves short-petioled, oblong or oblong-elliptic and 10–15 cm. long, acuminate, entire, pinnately nerved (palmately nerved in most of the other species listed here), appearing nearly glabrous; flowers greenish white, in long slender spikes; capsule coarsely tubercled.—Common in thickets and forests; widely distributed in tropical America. The name "barenillo" is reported from Cuyamel. In Costa Rica the tree is called "copalchí" and "quizarrá copalchí." The wood is brownish, moderately hard, and rather fine-textured.

Croton lobatus L. An erect bushy annual herb about a meter high, nearly glabrous; leaves long-stalked, deeply 3-lobed, the lobes taper-pointed and more or less toothed.—In a wet thicket near Tela; widely distributed in tropical America. An unattractive weed, when well grown somewhat resembling in general appearance the giant ragweed (*Ambrosia trifida*) of the United States.

Croton punctatus Jacq. A shrub 1 meter high or less, the dense pubescence of minute silvery scalelike stellate hairs; leaves oval or oblong, 2–4 cm. long, rounded at each end, entire.—Common along the beach, often forming dense clumps on hummocks of sand; widely distributed on the beaches of tropical America.

Croton pyramidalis Donn. Smith. A shrub or tree 4.5–6 meters high; leaves long-stalked, broadly oblong-ovate, about 10–20 cm. long, acute or short-acuminate, shallowly cordate at the base, entire or nearly so, densely stellate-pubescent but greener on the upper surface; flowers in long, much interrupted racemes.—In wet thickets, scarce; occurring also in Guatemala.

Croton tragioides Blake. *Quema-nariz.* A branching annual herb 30–60 cm. high, stellate-pubescent; leaves long-petioled, ovate or broadly ovate, 2–3.5 cm. long, shallowly cordate at the base,

coarsely crenate.—Occasional in open fields; ranging to Panama and Guatemala. Called "coquillito" in Panama. The Honduran name is a curious one, for which no explanation could be given.

DALECHAMPIA L.

These plants are herbaceous twining vines, the long-stalked leaves simple or 3-lobed or 3-parted. The flowers of both sexes are borne in a dense long-stalked cluster subtended by 2 large leaflike bracts which are either green or colored. The pistillate sepals are fringe-lobed and usually covered with stiff bristly hairs which sting the hands painfully.

Dalechampia laevigata Standl. A small vine, green and nearly glabrous; leaves ovate or oblong-ovate, long-acuminate, usually shallow-cordate at the base, nearly entire; bracts green, broader than long, about 3 cm. wide.—Frequent in wet thickets; known only from this region.

Dalechampia panamensis Pax & Hoffm. A small herbaceous vine; leaves divided into 3 lanceolate leaflets, the two lateral ones very unequal at the base, green and nearly glabrous; bracts green.—In wet thickets near Tela; extending to Panama.

Dalechampia scandens L. A small vine; leaves densely soft-pubescent, deeply 3-lobed, the lobes broad, rounded and abruptly tipped at the apex, nearly entire; bracts large, green.—In thickets near Progreso; widely distributed in tropical America. Called "bejuco de pan" in Salvador.

EUPHORBIA L. Spurge

This, the largest genus of the family, consists of a vast number of species scattered over the greater part of the world. The plants are very diverse as to habit and general appearance, some of the Old World species being cactuslike in aspect, while others are very small and inconspicuous herbs. They all have small flowers surrounded by an involucre which resembles a calyx and is often brightly colored, so that it may be mistaken for a corolla. The fruit is always a 3-lobed capsule.

Euphorbia ammannioides HBK. *Golondrina.* A prostrate glabrous herb, much branched; leaves opposite, short-petioled, oblong, entire, mostly 5–8 mm. long, the involucre with minute and inconspicuous appendages.—Common in sand of the beaches; widely distributed in tropical America. This small plant, like other similar species of the subgenus *Chamaesyce*, is used here in domestic medicine.

The name "golondrina" is applied generally in Central America and Mexico to Euphorbias of this group. In Mexico these plants have a high reputation as remedies for the bites of poisonous snakes, but in Central America they seem not to be used for this purpose.

Euphorbia brasiliensis Lam. *Golondrina.* An erect glabrous annual 30–60 cm. high, much branched, the branches very slender; leaves opposite, oblong to oval, minutely serrate, obtuse or rounded at the apex, 1–2 cm. long; involucre with inconspicuous appendages; seeds black.—A common weed; widely distributed in tropical America.

Euphorbia densiflora Klotzsch. *Golondrina.* A small prostrate herb, densely pubescent; leaves broadly oblong, obtuse or acute, toothed, opposite, short-petioled; appendages of the involucre rose-colored and petal-like.—On a grassy bank near Tela; widely distributed in tropical America.

Euphorbia graminea Jacq. A slender, erect or ascending annual, branched, sparsely and finely pubescent; leaves alternate, slender-petioled, oblong or lanceolate to ovate, entire, thin; involucres with small white petal-like appendages; bracts of the inflorescence small and usually white.—Frequent in fields and thickets about Progreso and La Fragua; widely distributed in tropical America.

Euphorbia heterophylla L. A coarse erect annual 30–60 cm. high or taller, sparsely branched, pubescent; leaves mostly alternate, very variable, oblong to elliptic or ovate, entire or the upper lobed or coarsely toothed, the uppermost usually whitish or pinkish at the base; flowers and involucres in dense clusters at the ends of the branches.—A weed in garden at Lancetilla, very rare here, apparently, but widely distributed as a weed in tropical America. Called "chilamatillo" and "hierba del duende" in Salvador.

Euphorbia hirta L. *Golondrina.* An erect or suberect herb, usually about 30 cm. high, densely pubescent, sparsely branched; leaves short-petioled, obliquely ovate or oblong, 1.5–3 cm. long, acute, toothed, opposite; involucres in small dense stalked cymes in the leaf axils; capsules pubescent.—A common weed; abundant in most parts of tropical America. Called "hierba de pollo" in Panama, and by the West Indians "milkweed." This and related species of *Euphorbia,* which usually grow plentifully about dwellings in Central America, at least in the *tierra caliente,* are believed to harbor the organisms which cause tropical ulcers, especially those upon the legs of children.

Euphorbia hypericifolia L. An erect glabrous annual, usually 30–60 cm. high, with numerous slender branches; leaves opposite, short-petioled, oblong, finely and inconspicuously toothed, 1.5–2.5 cm. long, obtuse, pale beneath; involucres with inconspicuous appendages, arranged in cymes in the leaf axils; seeds reddish brown.—A common weed; widely distributed in tropical America. Called "hierba de pollo" in Panama, but usually known as "golondrina" in Central America. This species is very close to *E. brasiliensis*, but the two may be separated easily by the color of the ripe seeds.

Euphorbia thymifolia L. *Golondrina.* A prostrate annual, densely pubescent; leaves opposite, short-petioled, oblong, obtuse, mostly 7–12 mm. long, finely serrate; involucres axillary, their appendages minute and inconspicuous.—A weed in garden at Lancetilla; the species is widely distributed in tropical America.

HIERONYMA Allem.

Hieronyma alchorneoides Allem. *Curtidor.* A large forest tree with conspicuous buttresses, sometimes 30 meters high or more; leaves alternate, long-stalked, elliptic to almost rounded, 12–20 cm. long, abruptly acuminate, rounded to acute at the base, entire, the pubescence of minute rusty scales; flowers of the two sexes on separate trees, arranged in small panicles in the axils of the leaves; fruit 1-seeded, black, fleshy, 2–3 mm. long.—Frequent in forests; ranging from Guatemala to South America. Called "pantano" in Panama. The wood is deep reddish brown, rather hard, and heavy. It is used here for tanning, and in some regions it is employed for general construction, cabinet work, posts, railroad ties, and boat building.

JATROPHA L.

Of this large genus there are only a few species in Central America. They are herbs, shrubs, or trees with alternate long-stalked leaves which are often lobed. The small, sometimes brightly colored flowers are arranged in cymes, the two sexes upon the same plant. The fruit is a 3-lobed capsule, or often somewhat fleshy.

Jatropha Curcas L. *Piñón.* A shrub or small tree; leaves mostly 10–15 cm. wide, shallowly 3–5-lobed, otherwise entire, nearly glabrous; flowers greenish yellow, in long-stalked cymes; fruit drupe-like, fleshy, the large seeds 2 cm. long.—Noted only about Tela, where it appeared to be a relic of former planting; probably not native here, but one of the common shrubs of Central America, and widely

distributed in tropical America. Called "coquillo" and "árbol santo" in Panama, and "tempate" in Salvador and some parts of Honduras. The shrub is often planted in Central America to form hedges. The seeds contain 25 to 40 per cent of an odorless oil which has been employed in making paints and soap and as a lubricant. They have an agreeable flavor, but so violent purgative properties that it is dangerous to eat them, and children have sometimes died after eating too large a number of them. When the kernels have been roasted, however, they are stated to be safe for human food. In Mexico there are often cultivated on this shrub or tree certain scale insects whose exudate of lac is highly esteemed for making varnishes.

Jatropha urens L. *Chichicaste.* A shrub 2–4.5 meters high with milky sap, armed throughout with long, slender but stiff, stinging hairs; leaves 12–30 cm. wide, deeply lobed, the lobes again lobed or sharply toothed, provided with hairs like those on the branches; flowers white, sweet-scented, about 1 cm. long, rather showy; fruit a dry rounded capsule.—In thickets near Progreso; widely distributed in tropical America. Known in Panama as "ortiga" and "prinamoza," and in Mexico as "mala mujer." The hairs sting very painfully, the pain lasting for hours or even for several days.

MANIHOT Adans.

Manihot esculenta Crantz. *Yuca. Cassava.* A large, bushy or treelike herb, or often somewhat shrubby, usually 1–2 meters high, glabrous; leaves long-stalked, very pale beneath, divided into 3–7 entire acuminate lobes; flowers large, green tinged with red, in small panicles; capsule with 6 narrow longitudinal wings.—Cultivated commonly, as it is throughout most of tropical America, and in many other tropical regions all over the earth; native of Brazil; often persisting about old fields in Central America. Although practically unknown in the United States and other temperate regions, cassava is one of the important food plants of the earth, and in large portions of South America it is the most important vegetable, furnishing the bread of the region. The very large roots somewhat resemble sweet potatoes. In Central America they are usually prepared for the table merely by boiling, but when prepared like French fried potatoes they are particularly good. When boiled they are rather solid and often somewhat soggy, although more often dry. They have no distinctive flavor, in this respect much resembling white potatoes.

There seem to be two distinct strains of the plant: one in which the roots are innocuous and require no special preparation; and an-

other in which the roots contain a poisonous substance that must be extracted by expressing as much as possible of the sap, after the roots have been grated, and by the use of heat. Both starch and tapioca are obtained from the roots.

In Central America the plant is most plentiful where there is Carib influence, and it is probable that the plant was introduced into Mexico, Central America, and the West Indies by these people in pre-Columbian times.

OMPHALEA L.

Omphalea diandra L. A shrub or tree 3–7.5 meters high, usually with long, trailing or sprawling branches; leaves alternate, long-stalked, oval or broadly oblong, about 15 cm. long, thick, obtuse and abruptly tipped, rounded at the base, densely soft-pubescent beneath, 3-nerved at the base, the petiole bearing 2 glands at its apex; flowers very small and greenish, the two sexes on the same plant, arranged in large open panicles; fruit said to be as large as an orange.—Frequent in wooded swamps close to the ocean; ranging to Panama and the West Indies.

PEDILANTHUS Poit.

Pedilanthus tithymaloides Poit. *Itamo. Slipper-plant.* A shrub 1–1.5 meters high, with green smooth stems and milky sap, often leafless; leaves nearly sessile, alternate, ovate to oblong, entire, glabrous; the small flowers enclosed in a showy red shoe-shaped involucre.—In thickets near Progreso, also cultivated; widely distributed in tropical America. In Central America often planted in hedges for ornament. Called "pie de niño" (baby's foot) in Panama and Salvador, and "bítamo real" in Salvador. The plant finds some use in domestic medicine. It is curious and rather handsome when in flower.

PHYLLANTHUS L.

These plants are herbs, shrubs, or small trees with alternate entire leaves which usually are arranged in 2 ranks along the branches. The very small flowers with green sepals and no petals are solitary or clustered in the leaf axils. The fruit is a small 3-celled capsule.

Phyllanthus Conami Sw. A slender shrub or tree up to 7.5 meters high; leaves ovate, 3–4 cm. long, acuminate, nearly glabrous, 2-ranked, the branches with their leaves suggesting the frond of a tree fern; capsules about 4 mm. long.—Roadsides near Tela; apparently not common here, although the species is abundant in many

parts of Central America, and is widely distributed in tropical America. Called "pimientilla" in Salvador, and "chilillo" and "gallina" in Costa Rica.

Phyllanthus diffusus Klotzsch. A glabrous perennial herb 30–60 cm. high, the stem much thickened near the base, with many slender branches; leaves oblong, rounded at the apex, 3–6 mm. long, pale beneath; capsules 2 mm. broad.—In marshy fields at Tela, and collected at Siguatepeque, in the interior; known also from Panama and Cuba. The thickened and spongy bases of the stems distinguish this species immediately from others of the genus.

Phyllanthus Niruri L. A slender, usually erect annual 30–60 cm. high, glabrous, commonly with long and very slender branches from the base; leaves oblong, 5–10 mm. long, rounded at the apex, pale beneath; capsules 2 mm. broad; seeds longitudinally striate on the back.—A common weed in moist soil, often in gardens; widely distributed in tropical America. Called "seed on the leaf" by the Barbadians living in the Canal Zone.

Phyllanthus urinaria L. A slender erect glabrous annual with numerous erect or ascending branches, usually 30–60 cm. high; leaves oblong, 1.5 cm. long, rounded at the apex, very pale beneath; capsules 2 mm. broad; seeds transverse-rugose on the back.—A weed in garden at Lancetilla; probably introduced with plants imported for cultivation; a native of the Old World which has been found also in the Canal Zone. Apparently it is only beginning to be introduced into Central America, but probably it will become common within a few years.

PLUKENETIA L.

Plukenetia angustifolia Standl. A slender woody vine; leaves alternate, oblong or lance-oblong, 6–12 cm. long, acuminate, acute to rounded at the base, remotely and inconspicuously serrate, nearly glabrous; flowers minute and green, in long slender bracted racemes; fruit a deeply 4-lobed capsule.—In wet thickets near Lancetilla, scarce; known also from Guatemala and British Honduras.

RICINUS L.

Ricinus communis L. *Higuerilla. Castor bean.* A large glabrous herb, in Central America often becoming treelike and somewhat woody, rarely more than 4 meters high, but often with a distinct trunk; leaves long-stalked, deeply lobed; flowers in dense stout racemes; capsule usually covered with soft fleshy spines.—

Frequent in waste places or thickets; widely distributed in tropical America; probably native of tropical Africa. From the seeds is obtained the castor oil of commerce ("aceite de castor," "aceite de ricino"), used in medicine as a purgative. It is employed also for lubricating machinery, especially that of airplanes, in the manufacture of soap, and in dyeing cotton goods. Small amounts of the oil are extracted in Central America, and the plants are sometimes grown for shade to protect young coffee plantations.

SAPIUM Jacq.

Sapium jamaicense Sw. A small tree, usually about 6 meters high, with copious milky sap; leaves alternate, long-stalked, oblong, finely serrate, abruptly acuminate, acute at the base, glabrous, 9–18 cm. long; petiole bearing two small glands near its apex; flowers green, in dense spikes, the two sexes upon the same tree; fruit a small capsule.—Frequent in thickets and forests; ranging to Panama and the West Indies. In some parts of Central America the milk of *Sapium* trees is reputed very poisonous, and for this reason the trees are left standing when clearings are made. In Panama, however, the boys prepare bird lime, for use in catching small songbirds, by chewing the coagulated sap. It may be that the different species have different properties, and it is also possible that none of the trees are poisonous. Some of the South American species of this genus are important sources of commercial rubber, but the Central American trees have not been exploited for this purpose.

TETRORCHIDIUM Poepp. & Endl.

Tetrorchidium rotundatum Standl. *Manteca.* A large tree, sometimes 30 meters high, with rounded crown, the sap milky; leaves alternate, slender-petioled, oblanceolate-oblong, 8–15 cm. long, rounded at the apex, narrowed to the base, entire, glabrous; petiole bearing 2 small glands near the apex; flower panicles spikelike, pubescent, the flowers small, green.—Frequent in the forests and sometimes in open pastures; also in Nicaragua. The wood is creamy white and odorless. The trunk is often supported by buttresses.

TRAGIA L.

The Tragias are herbaceous vines, usually furnished with stiff spreading hairs. The alternate leaves are long-petioled, more or less toothed, and usually cordate at the base. The small green flowers

are arranged in racemes, the two sexes upon the same plant. The fruit is a small 3-celled capsule.

Tragia Bailloniana Muell. Arg. *Chichicaste. Plate XLIV.* A small or large vine, herbaceous or somewhat woody, the stem and leaves hirsute; leaves very large and thin, 15–25 cm. long, rounded-ovate, long-acuminate, deeply cordate at the base, often deeply 3-lobed; stipules green, large and conspicuous; racemes very long, bifurcate, one branch with staminate flowers, the other with pistillate; capsule more than 1 cm. broad, densely hirsute.—Frequent in wet forest and thickets; known also from southern Mexico. The Honduran material agrees well with the not too satisfactory description of the Mexican species, of which I have seen no authentic material. The abundant hairs of the plant sting as painfully as those of a nettle.

Tragia volubilis L. A small herbaceous vine, armed with more or less stinging hairs, the branches very slender; leaves ovate to oblong, 3–6 cm. long, acuminate, shallowly cordate at the base or often only obtuse, serrate.—In thickets near Progreso; also in the interior; widely distributed in tropical America. Called "pan caliente" (hot bread) in Salvador, a not inappropriate name, for the hairs sting like those of a nettle, although perhaps not quite so painfully or so severely as those of *T. Bailloniana.*

ANACARDIACEAE. Cashew Family

The members of the cashew family are trees or shrubs with alternate, simple or pinnate leaves. The small whitish flowers are panicled and have a 3–7-cleft calyx, 3–7 petals, and as many or twice as many stamens. The fruit is usually fleshy and contains a single seed. To the family belong the sumacs of the United States, also poison ivy (*Rhus Toxicodendron*), poison sumac (*Rhus Vernix*), and the Peruvian pepper-tree (*Schinus Molle*), so commonly grown as a shade tree in California.

One species of sumac (*Rhus terebinthifolia* Schlecht. & Cham.) grows in the mountains of central Honduras. Other genera of trees represented along the Atlantic coast of Central America are *Metopium* (in British Honduras), whose representatives are as dangerous as poison ivy, and mosquito wood (*Mosquitoxylum jamaicense* Krug & Urb.), which is called "jobillo" in Panama, and grows also in British Honduras.

ANACARDIUM L.

Anacardium occidentale L. *Marañón. Cashew.* A small or medium-sized tree, nearly glabrous, with obovate short-petioled leaves, rounded at the apex; flowers reddish or purplish, in large panicles.—Common along the coast near Tela, also planted; generally distributed at lower altitudes in Central America, especially on the Pacific slope, where it often forms nearly pure stands. Some very large trees occur near Tela.

The curious fruit consists of a large grayish kidney-shaped nut borne at the apex of what appears to be a fleshy fruit, but is really an enlarged hypocarp. This "fruit" resembles a bullnose pepper in size, shape, and color. It is soft and spongy, very juicy, and of fairly agreeable flavor. Although not one of the best of Central American fruits, it is a popular one, and is often served on the table as a dessert fruit, or used for flavoring ices and beverages.

The outer coat of the nut contains cardol, an acrid caustic oil which blisters the skin. By roasting this is volatilized, and the seeds are then very good to eat. They are employed commonly for flavoring candies. In recent years they have made their appearance in the markets of the United States, and they may now be obtained, salted like almonds, at most of the refreshment stands which line our roadsides all too thickly.

The tree is often planted in Central America for its fruit. Its wood is grayish, pinkish, or brownish, moderately hard and strong, but not very resistant to decay. The oil obtained from the seeds sometimes is used to preserve articles of wood and leather from the attacks of termites and other insects, and a gum which exudes from the bark is utilized for the same purpose.

Another species, *Anacardium excelsum* (Bert. & Balb.) Skeels, is a giant tree of the forests of Costa Rica and Panama, where it is called "espavé," "espavel," and "wild cashew."

ASTRONIUM Jacq.

Astronium graveolens Jacq. *Frijolillo.* A tall tree with small narrow buttresses; leaves pinnate, the numerous oblong or ovate leaflets nearly glabrous, stalked, toothed, with long tapering tips; flowers small, in large panicles; sepals becoming much enlarged and thin and surrounding the small dry oblong fruit.—Common on the forested hills about Lancetilla, and widely distributed in Central America. Called "zorro" in Panama, "ronrón" in Salvador, and the

names "palo obero" and "ciruelillo" are reported for Honduras. The last is probably the correct Honduran name.

The wood is hard and heavy, red or reddish brown, often streaked with black. It is durable, and is used in Central America for house construction and for furniture.

MANGIFERA L.

Mangifera indica L. *Mango* (Spanish and English name). The mango, imported from the East Indies, is planted commonly and grows as an escape along roadsides. It is the favorite fruit of the Central American people, and the fruits are consumed in enormous quantities during their season, the late spring and summer months. Although most of the mangos of Central America have an abundance of tough fiber and a too pronounced turpentine flavor, superior varieties are grown in some localities. The fruit of the better forms is delicious to eat raw, and is also good when stewed or made into pies.

SPONDIAS L.

Spondias Mombin L. *Hobo, Jobo, Ciruela. Hogplum.* A medium-sized tree with nearly smooth, pale bark; leaves pinnate, the numerous leaflets almost glabrous, stalked, very asymmetrical, entire or toothed, with long narrow tips; flowers greenish, in large panicles at the ends of the branches.—Frequent in thickets near the sea; much planted for living fence posts. A common tree of Central America. The sap has a strong aromatic odor. The yellow plumlike fruit is edible, but not of altogether agreeable flavor. The wood is coarse-grained and soft and of little value.

Spondias purpurea L. *Ciruela. Spanish plum.* A shrub or small tree with few thick branches; leaflets small, blunt at the apex; flowers red or purplish, in small dense panicles along the old branches. —Common in thickets and along fence rows; widely distributed in tropical America. The fruits are usually red or purple, and resemble small plums in size and appearance. Those of some trees are very good to eat, and resemble plums in flavor. The leaves have a strong acid flavor. The trees are often planted in Central America as living fence posts.

AQUIFOLIACEAE. Holly Family

ILEX L. Holly

Ilex panamensis Standl. A glabrous tree 6 meters high or more; leaves persistent, alternate, entire, without stipules, short-

petioled, oblong or oblanceolate-oblong, abruptly short-pointed, acute at base, leathery, the veins inconspicuous; flowers small, greenish, solitary or clustered in the leaf axils, short-stalked; fruit a small rounded berry.—Frequent in the hillside forests and in thickets near the coast; known also from Panama, where it is called "garlic wood." The identity of the Honduran material is somewhat uncertain because the specimens are not in the best condition for study, and it may be that they represent a distinct species. Specimens with leaves exactly like those of the coastal tree were collected at Siguatepeque. The wood of the Panama tree is described as creamy white when cut, but turning greenish gray immediately upon exposure.

Species of *Ilex* are rare in Central America, but five or six are known from the mountains of Costa Rica.

HIPPOCRATEACEAE. Hippocratea Family

The group consists of woody vines having opposite, entire or somewhat toothed leaves, the stipules being minute and deciduous. The small perfect greenish flowers are arranged in axillary cymes. They have a 5-parted calyx; usually 5 petals, which frequently are toothed; normally 3 stamens, inserted on a well-developed disk; and a 3-celled ovary, with a simple or 3-lobed stigma.

HIPPOCRATEA L.

In this genus the fruit is a capsule, which is much depressed vertically, and deeply 3-lobed. The seeds are broadly winged.

Hippocratea Mitchellae Johnston. A scandent shrub; leaves elliptic or ovate-oblong, obscurely crenate-serrate, 8–15 cm. long, obtuse, glabrous; flowers white, fragrant, the branches of the inflorescence glabrous; petals 6 mm. long.—In thickets near Tela; known only from this locality.

Hippocratea volubilis L. A large vine climbing over trees; leaves short-petioled, obtuse or rounded at the apex, glabrous or nearly so; cymes small and few-flowered, densely and finely pubescent.—In wet thickets or wooded swamps near the coast; widely dispersed in tropical America.

SALACIA L.

Salacia belizensis Standl.(?). A large woody vine; leaves narrowly oblong or lance-oblong, thick and leathery, long-acuminate, nearly entire; fruit large, globose, somewhat baccate, the seeds not

winged.—In wet forest; occurring also in British Honduras. The specimens from Honduras are sterile, and their specific determination consequently very uncertain.

CELASTRACEAE. Bittersweet Family

MYGINDA Jacq.

Myginda eucymosa Loes. & Pitt. A glabrous shrub or small tree, sometimes 6 meters high, the bark dark olive brown, smooth but somewhat flaky; leaves opposite, short-petioled, ovate to oblong, obscurely serrulate; flowers minute, whitish, in small stalked axillary cymes, with 4 petals and 4 stamens; fruit a red plumlike drupe 1–2 cm. long.—Frequent in hill forest; ranging from British Honduras to Panama. Called "carbón" in British Honduras. The wood is described as reddish yellow and odorless.

STAPHYLEACEAE. Bladdernut Family

TURPINIA Vent.

Turpinia paniculata Vent. A glabrous tree about 6 meters high; leaves opposite, pinnate, the 5–11 leaflets ovate to lance-oblong, acuminate, obtuse or rounded at the base, crenate or entire; flowers small, white, in terminal panicles; sepals and petals each 5, the stamens of the same number; fruit 3-celled, globose, indehiscent, 1–1.5 cm. in diameter.—Occasional in wet forest or thickets; widely distributed in tropical America, but seldom abundant in Central America.

SAPINDACEAE. Soapberry Family

The plants here listed for the soapberry family are trees or shrubs or woody vines, sometimes furnished with tendrils. The leaves are alternate, petioled, usually compound, and without stipules. The small, chiefly whitish flowers are regular or nearly so and have 4 or 5 sepals or calyx lobes, 3–5 petals, 5–10 stamens inserted on a disk, and a 2–4-celled ovary. The fruit is either dry or fleshy, and very variable as to its form.

ALLOPHYLUS L.

Allophylus occidentalis (Sw.) Radlk. A large shrub or small tree; leaves long-stalked, their 3 leaflets elliptic, thin, acuminate, toothed or nearly entire, puberulent or glabrate. The small whitish flowers are arranged in panicles in the axils of the leaves, and the fruit is a red drupe about 6 mm. long.—Sterile specimens probably

referable to this species were collected in wet forest above Lancetilla; the species is widely distributed in tropical America.

BLIGHIA Koenig

Blighia sapida Koenig. *Akee.* A small tree; leaves pinnate, with about 10 large, elliptic or oblong, nearly glabrous leaflets; flowers small, fragrant, white, in axillary racemes; fruit a 3-celled, green or red capsule, containing large black seeds subtended by a white aril.—Planted at Puerto Arturo, and probably elsewhere; native of West Africa. Called "seso vegetal" (vegetable brain) and "huevo vegetal" in some parts of Central America. The akee is little grown in Central America except where there are West Indian inhabitants. The fleshy aril is edible, usually being prepared for the table by frying, but when raw it is said to be a deadly poison.

CUPANIA L.

Cupania glabra Sw. *Cola de pavo.* A shrub or tree 4.5–9 meters high; leaves stalked, pinnate, the leaflets usually about 10, oblong, 7–16 cm. long, obtuse, toothed or entire, glabrous or nearly so; flowers whitish, in large pubescent panicles; fruit a deeply lobed, brown capsule 1.5 cm. long; seeds subtended by a fleshy aril.—Common in wet forest and thickets; widely distributed in tropical America. The wood is said to be red, hard, heavy, and compact.

DODONAEA Jacq.

Dodonaea viscosa Jacq. A shrub about 1.5 meters high; leaves oblong-oblanceolate, simple, entire, obtuse, nearly glabrous, viscid; flowers yellowish, in small lateral clusters; petals none; fruit a narrow capsule, broadly 3-winged, 1.5–2.5 cm. broad.—In thickets along the beach near Tela; widely distributed in tropical America. The wood is reported to be brown, close-grained, and hard. This shrub in its various forms has a very wide distribution, being found in many tropical regions in remote parts of the earth.

PAULLINIA L.

The Paullinias are large woody vines with compound leaves and with small white flowers, the inflorescences usually provided with tendrils. The fruit is a terete or 3-winged capsule, often tinged with red, and containing 1–3 black seeds subtended by fleshy white arils.

Paullinia costaricensis Radlk. *Pate.* A large woody vine; leaves triternate, composed of 9 leaflets, these elliptic or rhombic,

acuminate, coarsely toothed; fruit globose or obovoid, nearly 1 cm. broad, orange-red, terete, minutely and inconspicuously pubescent.—Common in wet thickets; ranging to Costa Rica and southern Mexico.

Paullinia cururu L. A small woody vine; leaflets 3, elliptic-oblong, acuminate, acute at the base, remotely toothed, nearly glabrous; fruit terete.—Collected in a thicket near Progreso; widely distributed in tropical America. Known in Nicaragua by the name "chilmecate."

Paullinia fuscescens HBK. *Pate.* A large woody vine; leaves with 9 leaflets, these oblong to rhombic, acute, coarsely toothed, softly pubescent on both surfaces; fruit dull red, broadly 3-winged.—In thickets or wooded swamps along the coast; generally distributed in Central America.

Paullinia pinnata L. *Pate.* A large woody vine, glabrous or nearly so; leaves pinnate, the 5 leaflets oblong to ovate or lanceolate, thick and leathery, acute, coarsely toothed, the rachis of the leaf broadly winged; fruit large, obovoid, brown or red, terete, the black seed subtended by a white aril.—Common in thickets; widely distributed in tropical America. The vernacular name is derived from an Aztec word signifying "medicine." The name "nistamal" is said to be applied to the vine in some parts of Honduras, and in Salvador it is called "chilmecate," "nistamalillo," and "pozolillo." In the British West Indies the name "bread and cheese" is applied to the plant.

This is one of the barbascos employed in Central America for stupefying fish, and many other scandent plants of this family are employed in the same manner. The crushed leaves and branches are thrown into a pond or quiet stream, and soon afterward the fish float stupefied upon the surface, where they may be secured easily. The poisonous properties of the plant have no deleterious effect upon the fish as human food, and it is said that if left in the water the fish later recover and swim away. The seeds of this and other species of *Paullinia* are reputed poisonous. From the seeds of a Brazilian species there is prepared a beverage resembling coffee. The seeds of the same species (*P. cupana* HBK.) are an official drug of the United States Pharmacopoeia, under the name "guarana," being administered as a remedy for chronic diarrhea.

Paullinia scarlatina Radlk. *Pate. Plate XLV.* A large woody vine, nearly glabrous; leaves pinnate, the 5 leaflets oblong to ovate, entire or nearly so, long-acuminate; fruit bright red, subglobose,

2 cm. or more in diameter.—Common in thickets; occurring also in Guatemala. This is one of the plants used on the coast of Honduras for poisoning fish.

SERJANIA Schumach.

The Serjanias are large woody vines provided with tendrils, in general appearance much like the species of *Paullinia*. The small whitish flowers, in short or long racemes, resemble those of that genus. The fruits, however, are very different, those of *Serjania* consisting of 3 samaras, that is, dry winged 1-seeded divisions, the seed being borne in the upper part of the cell and the lower part of the cell being developed into a large wing. The species of this genus are used like the Paullinias as fish poisons. The tough stems of the plants of both genera often are used as a substitute for rope.

Serjania cardiospermoides Schlecht. & Cham. *Crespillo.* A large woody vine; leaves with 3 leaflets, these ovate to oblong, thin, pubescent, acuminate, coarsely toothed or shallowly lobed; fruits about 4 cm. long.—Found in a wet thicket near Progreso; ranging to southern Mexico.

Serjania mexicana Willd. *Crespillo.* A large woody vine with white flowers; leaves twice ternate, with 9 leaflets, these oblong to ovate, usually acute or acuminate, toothed or almost entire, glabrous or nearly so; fruit 2–2.5 cm. long.—Occasional in thickets; widely distributed in tropical America. The name "barbasco" is reported from Honduras, and in Costa Rica the vine is called "turizo." The Honduras specimens are without fruit, and their determination is uncertain.

BALSAMINACEAE. Balsam Family

IMPATIENS L.

Impatiens Balsamina L. *China. Touch-me-not, Balsam.* This well-known garden plant is planted commonly in Honduran gardens. It is one of the favorite flowers of Central America.

RHAMNACEAE. Buckthorn Family

The Rhamnaceae are trees or shrubs with simple, entire or toothed leaves which are usually provided with stipules. The small, greenish or whitish flowers have a 4–5-lobed calyx, 4 or 5 small petals (these are sometimes absent), and 4 or 5 stamens opposite the petals. The fruit is either dry or fleshy.

COLUBRINA Rich.

Colubrina rufa Reissek. A tree 6–9 meters high, the young branchlets densely reddish-tomentose; leaves alternate, petioled, thin, oval to ovate, entire, mostly 9–15 cm. long, short-acuminate, nearly glabrous, bearing 2 glands on the lower surface near the base; flowers small, greenish, in small peduncled cymes, the inflorescence reddish-pubescent; fruit a small globose 3-celled capsule.—Collected in a wet thicket near Progreso; ranging to Panama and South America.

GOUANIA Jacq.

The Gouanias are large shrubs with long trailing branches, or sometimes large vines, and provided with tendrils. The leaves are alternate, short-petioled, ovate or elliptic, acute or acuminate, and shallowly toothed. The small whitish flowers are arranged in long slender racemes. The hard dry fruit is furnished with 3 narrow or broad, vertical wings.

Gouania eurycarpa Standl. A shrub 3–4.5 meters high; leaves 5–9 cm. long, densely and softly pubescent beneath; fruits 1.5 cm. broad, densely pubescent.—Known only from Progreso, where it grows in wet thickets.

Gouania lupuloides (L.) Urban. A slender shrub 3–4.5 meters high; leaves glabrous or nearly so.—Noted in this region only in thickets about Progreso; widely distributed in tropical America, but in Central America much less frequent than the following species. Called "rabo de mono" in Nicaragua, and "chewstick" in the British West Indies.

Gouania polygama (Jacq.) Urban. *Limpia-dientes.* A slender shrub 3–4.5 meters high; leaves densely and softly pubescent beneath; flowers white or whitish; fruit 7–9 mm. broad.—Frequent in wet thickets; widely distributed in tropical America. The twigs give a copious lather when chewed, and in Honduras, as well as in many other regions, they are chewed and used as brushes for cleaning the teeth. The dried stems of the various species have been shipped abroad to be used in the preparation of dentifrices. In Jamaica the bitter foliage formerly was employed as a substitute for hops in brewing beer.

Sageretia elegans (HBK.) Brongn. may occur about Tela, for I found it in thickets near La Ceiba. It is a stiff shrub with opposite petioled leaves which are ovate and sharply toothed. The same species grows also in the mountains of the interior.

VITACEAE. Grape Family

The plants of the grape family are large woody vines with tendrils and with alternate petioled leaves. The very small flowers, arranged in panicles or cymes, have a 4–5-toothed calyx, 4 or 5 distinct or coherent petals, and 4 or 5 stamens opposite the petals. The fruit is a berry containing few seeds, and is usually 2-celled.

CISSUS L.

The species of *Cissus*, although closely related to the grapes, are not likely to be confounded with them because their general appearance is conspicuously different, although the differences are hard to describe. Their fruits are not edible. In *Cissus* the petals are distinct; in *Vitis* they are united and fall away from the flower as a cap.

Cissus cardiophylla Standl. A large woody vine; leaves simple, ovate or oblong-ovate, acuminate, cordate at the base, distantly toothed, nearly glabrous, thick and somewhat fleshy; flowers bright red, in small cymes; berries obovoid, 1–1.5 cm. long.—Common in wet thickets; ranging to Costa Rica. The vine is a showy one because of the brightly colored flowers. It climbs to the tops of rather tall trees.

Cissus rhombifolia Vahl. *Pica-mano.* A large vine; leaves composed of 3 leaflets, these oblong to ovate or elliptic, acute, rather inconspicuously toothed, sparsely hairy; flowers bright red; berries obovoid, about 7 mm. long.—Frequent in wet thickets; widely distributed in tropical America. Called "comemano" and "uva cimarrona" in Salvador. The sap is said to cause blisters upon the skin, but I have never seen this demonstrated, nor have I ever felt inclined to prove it by personal experience.

Cissus sicyoides L. *Pica-mano.* A large vine, often with long pendent aerial roots; leaves simple, broadly ovate, rounded to deeply cordate at the base, acute or acuminate, toothed, often densely pubescent; flowers yellowish green, in dense cymes; berries small, purplish black.—Common in thickets, climbing to the tops of tall trees; widely distributed in tropical America. The sap of this species is acrid like that of the preceding one. The tough flexible stems often are employed as a substitute for twine. The inflorescences frequently are attacked by a smut which so distorts them that they resemble a parasitic plant. It is reported that when the leaves are macerated in water they give a copious lather, and that they are sometimes

employed in laundry work as a soap substitute. The plant is known as "comemano" in most parts of Central America.

VITIS L.

Vitis tiliaefolia Humb. & Bonpl. *Uva. Wild grape.* A large woody vine, the stems sometimes 15 cm. thick; leaves long-petioled, usually shallowly 3-lobed, sharply toothed, woolly beneath; flowers small, greenish, sweet-scented, in dense panicles; fruits 6–8 mm. in diameter, purplish black, very sour.—Common in forest and wet thickets; widely distributed in tropical America. Called "bejuco de agua" in Panama; "uva montés" and "uvilla" in Salvador. On the coast of Honduras this plant is of interest chiefly because it is one of the water vines. If from one of the larger stems a section about a meter long is cut, there issues about as rapidly as it can be drunk a stream of clear flavorless liquid, which makes a good substitute for water. The sap is cool and quite agreeable to drink. I saw this demonstrated several times in the course of tramps over the hills about Lancetilla, and found the plant a very welcome one along the hilltops, where there is no surface water to be found. Various other plants, especially vines of the family Dilleniaceae, may be used in the same fashion. The fruits of the Central American wild grape are too small and sour to be eaten, but they are sometimes gathered for making vinegar.

The European grapes are planted occasionally in Central America, and I have seen several acres of them in a plantation in Guanacaste, Costa Rica. As a rule they are grown only about the fincas as a curiosity or for experimental purposes, and they do not seem to thrive in the region.

TILIACEAE. Linden Family

The Tiliaceae are mostly trees or shrubs, their pubescence often of branched hairs. The leaves are alternate, simple, petioled, sometimes lobed, and provided with stipules. The flowers are small or large and showy, with 5 free or coherent sepals, normally 5 petals, and usually numerous stamens. The fruit is a dry capsule or a berry, or often burlike.

The genus *Apeiba*, represented by two common Central American trees, strangely enough, has not been noted within this area.

CORCHORUS L.

Corchorus siliquosus L. A slender shrub about a meter high, or sometimes herbaceous; leaves ovate, acute or acuminate, slender-

stalked, obtusely toothed; flowers small, yellow, in the leaf axils; fruit a linear pod 5–6 cm. long.—A frequent weed at Progreso, in fields and banana plantations, but not noticed about Lancetilla; widely distributed in tropical America. Called "escobilla" in Panama and "té de perla" and "té del monte" in Salvador. The jute of commerce is obtained from the bark fiber of two Old World species of this genus.

BELOTIA A. Rich.

Belotia Campbellii Sprague. *Capulín.* A tree 8 meters high or often taller; leaves oblong or ovate, short-petioled, long-acuminate, 3-nerved from the base, very finely toothed or nearly entire, green above, covered beneath with a fine pale stellate pubescence; flowers about 6 mm. long, arranged in dense many-flowered cymes, with violet petals and pink sepals; pod compressed, 2-celled, rounded but broadest toward the apex, very hairy, containing numerous hairy seeds.—A common tree of the hillsides and clearings; ranging to British Honduras, where it is called "moho." The tree is a very beautiful and showy one when in flower, at the end of March, and is conspicuous on the hillsides about the Lancetilla Valley.

HELIOCARPUS L.

The *Heliocarpus* species, of which only a few occur in Central America, are small or medium-sized trees with large thin leaves which are long-stalked, finely toothed, and sometimes lobed; the very small flowers are greenish or yellowish and arranged in large open panicles. The fruit is altogether distinctive, being elliptic and 3–5 mm. long, its margin fringed with a dense row of long slender hairy bristles. The wood is whitish, light, soft and spongy, and rather coarse-grained. It is probably of little value, and is seldom used.

Heliocarpus appendiculatus Turcz. *Majao.* A tree about 10 meters high with smooth brownish bark; leaves long-pointed, covered beneath with a fine whitish pubescence of close branched hairs, the blade bearing at its very base small green stipulelike appendages.—Noted only in a pasture above Lancetilla; widely distributed in Central America.

Heliocarpus Donnell-Smithii Rose. *Majao.* A tree 6–12 meters high with smooth, pale or brownish bark, the crown rounded; leaves not appendaged at the base, green beneath, but with a fine stellate pubescence; fruits green or often reddish.—Common in thickets and pastures; ranging from southern Mexico to Nicaragua

and perhaps farther southward. Called "moho" in British Honduras. The tree often springs up as a weed in cut-over land, and grows rapidly. The wood is not used in this region.

LUEHEA Willd.

Luehea Seemannii Triana & Planch. *Caulote, Guácimo. Plate XLVI.* A large tree, often 15 meters high or larger; leaves oblong or obovate-oblong, acuminate, short-petioled, 3-nerved at the base, finely toothed, green above, covered beneath with a dense feltlike pale brownish pubescence of branched hairs; flowers rather small, in dense cymes, the petals greenish white, the calyx 1 cm. long; fruit dry, 2–2.5 cm. long, densely pubescent, deeply 5-lobed.—Common in lowland forests and in thickets or pastures; ranging southward to Panama. Called "guácimo" in Panama and Costa Rica, and the name "yayo" is reported from Honduras. This is one of the giant trees of the Atlantic coast, in Costa Rica often attaining an enormous size. The wood is not used in the Tela region.

TRIUMFETTA L.

Triumfetta Lappula L. *Mozote.* A shrub 1–2 meters high with tough bark; leaves long-stalked, ovate to rounded, often shallowly lobed, irregularly toothed, long-pointed, finely stellate-pubescent, especially beneath; flowers very small, in narrow spikelike panicles, without petals, the numerous stamens yellow; fruit a bur about 6 mm. in diameter, covered with slender barbed spines.—Common in thickets; a widely distributed weedy shrub of tropical America. Called "cadillo" and "pega-pega" in Panama; "mozote de caballo" and "mozotillo" in Salvador. The burs adhere tenaciously to any object with which they come in contact, and thus are widely dispersed. In the thickets in which the shrub grows, one's clothing is soon covered with the troublesome burs. The mucilaginous sap of the plant has been employed for clarifying sirup.

DICRASPIDIA Standl.

Dicraspidia Donnell-Smithii Standl. A tree about 5.5 meters high; leaves short-petioled, lance-oblong, acuminate, crenate, cordate and oblique at the base, green on the upper surface, densely whitish-tomentose beneath with stellate hairs; stipules large and leaflike, centrally peltate; flowers large, solitary, inserted above the leaf axils, 5 cm. broad; ovary inferior; fruit baccate, 1.5 cm. broad.—Collected near Progreso; occurring also in Costa Rica and Panama.

This recently described (Field Mus. Bot. 4: 227. 1929) tree is an anomalous and very curious one, which may be recognized at once by its remarkable stipules.

MUNTINGIA L.

Muntingia Calabura L. A tree 6–7.5 meters high, the pubescence of branched hairs; leaves nearly sessile, lance-oblong, very unequal at the base and 3-nerved, acuminate, irregularly toothed; flowers solitary in the leaf axils on long slender stalks, the white or pinkish petals about 1 cm. long; fruit a red or yellowish, globose berry 1 cm. in diameter, containing very numerous small seeds.—Frequent in thickets in the region of Progreso and Guaymas, but not noticed about Tela; widely distributed in tropical America. Called "pasito" in Panama, and "capulín" in many parts of Central America. No name could be obtained for the tree at Progreso. The flesh of the fruit is exceedingly sweet, and is eaten, especially by children. The bark contains a tough fiber which has been utilized in some regions for making rope.

SLOANEA L.

Sloanea sp. Sterile material of one and perhaps two species of this genus was obtained about Lancetilla and Tela. It was taken from large trees having rather small, obovate or obovate-oblong, nearly glabrous leaves rounded at the tip and tapering to the base. I have been unable to refer the specimens to any of the several species described from Central America, and it is probable that they represent one or two undescribed species, but this can not be determined until flowers or fruit have been collected. Some of the trees of this genus furnish strong and durable wood useful for construction and other purposes.

MALVACEAE. Mallow Family

The mallow family is a very large group of plants, well represented in Central America. They are mostly herbs but often woody, and sometimes reach the size of trees. The pubescence in perhaps the majority of the species consists of branched hairs of various form. The leaves are alternate, simple, often lobed, and provided with stipules. In the variously arranged, sometimes showy flowers there are 5 more or less united sepals, 5 colored petals, and numerous stamens united to form a column. The fruit is usually dry and composed of several few-seeded carpels arranged like the sections of an orange, but in some groups the fruit is a capsule, or fleshy. Most of the Malvaceae have tough bark and mucilaginous sap.

GOSSYPIUM L. Cotton

Gossypium mexicanum Tod. *Algodón. Mexican cotton.* A coarse shrub, the leaves deeply 3-lobed, the lobes sharp-pointed and usually entire; flowers large, pale yellow, turning dull red in fading.—Often planted about houses and sometimes found in waste places; widely distributed in Mexico and Central America. This native cotton probably was cultivated by the aborigines, who were acquainted with its uses. In Central America it always appears to be an introduced plant, growing along roadsides or in thickets never very far from settlements. Cotton was woven into cloth long before the Conquest, and is found in ancient graves.

Some of the cottons are natives of America, but others are indigenous in the Old World. Cotton is planted for market about La Ceiba, at least experimentally, but not in the region of Tela. It is grown in certain regions of Guatemala and on a smaller scale in Salvador.

HIBISCUS L.

Hibiscus Abelmoschus L. *Algalía.* A tall coarse herb covered with stiff spreading hairs; leaves deeply lobed, very rough-hairy; corolla 8–10 cm. long, bright yellow; calyx early deciduous; capsule large, hairy, the numerous seeds smooth, not hairy.—Occasional in thickets and waste places; native of the East Indies, but often cultivated and naturalized in Central America. The large flowers are very beautiful. The plant is often grown for ornament, and for its seeds, which have the odor of musk. In Salvador it is called "almizcle"; by the West Indians it is known as "wild okra."

Hibiscus bifurcatus Cav. A coarse herb or shrub 1–2.5 meters high, the stems abundantly armed with short spinelike prickles; leaves 3–5-lobed, the lobes narrow, acuminate, toothed; bracts surrounding the calyx dilated and 2-lobed at the apex; corolla rose-pink, 8 cm. long.—Frequent in marshes near the coast, usually growing in water; common along the Atlantic coast of Central America. Called "algodoncito" in Panama. The plant is a showy and handsome one.

Hibiscus cannabinus L. A low annual; leaves green, sparsely hairy, coarsely toothed and lobed; bractlets about the calyx dilated and forked at the apex; petals dark red, 2 cm. long.—Found only as a weed in the streets at Tela; native of the East Indies. Sometimes grown for ornament in Central America, although not a very attractive plant.

Hibiscus esculentus L. *Ocra. Okra.* This well-known plant, native of Africa, is grown in gardens in this region, as it is almost everywhere in Central America, especially where there is a large West Indian population. Probably it was brought to America by the negro slaves at an early date. In Panama the okra is called "ñajú," in Salvador "gombo," and in Mexico "chimbombo" and "quingombo." The plant is cultivated extensively in the United States, especially in the South, for the young pods, which are cooked in various ways. In Central America it is reported that the seeds are sometimes used as a coffee substitute.

Hibiscus Lambertianus HBK. A shrub or a coarse herb 1.5–3 meters high; leaves narrow, oblong-lanceolate, long-acuminate, usually pale and softly pubescent beneath; flowers 8 cm. long, bright rose-pink.—Noted only in the Toloa Swamp, where it is abundant and very conspicuous, growing in shallow water in extensive colonies. The plant grows in South America, but probably has not been reported previously from North America. The flowers are strikingly beautiful, much like those of some of the rose-mallows of the United States.

Hibiscus Rosa-sinensis L. *Mar pacífico, Amapola, Campana, Clavel. Chinese hibiscus.* This well-known garden plant is grown commonly for ornament in the Tela region, and is one of the most widely planted ornamentals of Central America. It is a native of China. At the Lancetilla Station there have been planted numerous hybrid forms, brought from Hawaii, which are the handsomest varieties I have ever seen in Central America, if not anywhere. In China the petals, which turn black when crushed, are used for blacking shoes and for dyeing the hair and eyebrows, also to color liquors. They impart to paper a bluish tint that reacts like litmus. In various parts of Central America this hibiscus is called "clavel," "clavelón," and "tapo."

Hibiscus Sabdariffa L. *Rosa de Jamaica. Roselle, Jamaica sorrel.* A tall coarse rough-hairy much-branched herb, the leaves deeply lobed, the lobes long and narrow; stems tinged with red; flowers large, creamy-white, with a dark red eye; calyx becoming much enlarged, red, and fleshy after flowering.—Planted commonly in gardens, especially by the West Indians; native of the East Indies, and grown frequently in Central America, especially in the parts under West Indian influence. Much planted in Florida. The large fleshy calyces and pods contain an abundant juice with agreeable acid

flavor, and they are much used for making refreshing drinks and for jams and jellies. In Panama the roselle is called "viñuela," and among the Jamaicans it is usually known as "sorrel."

Hibiscus schizopetalus (Mart.) Hook. *Campana, Viuda alegre.* Similar in most characters to *H. Rosa-sinensis,* but the flowers pendent on long pedicels, and the petals deeply laciniate-lobed.—Planted for ornament; native of tropical Africa. Known in various parts of Central America as "paragüita china," "clavel," "clavel de canastilla," and "avispilla de canastilla." One of the common ornamental shrubs of Central America.

Hibiscus tiliaceus L. *Majao. Mahoe.* A shrub or small tree; leaves rounded, abruptly pointed, nearly entire, green above, covered beneath with a whitish felt; flowers yellow, 5–7 cm. long, large and showy.—Common in swampy thickets along the beaches, often forming almost pure stands; widely distributed in tropical America. The wood is whitish or purplish, light and soft but firm, easy to work, taking a high polish, and durable. The tough fiber of the bark has been much used for making cordage, and has been of commercial importance. In some regions it is employed for making mats and coarse cloth. In Panama the tree is called "majagua."

MALVASTRUM Gray

Malvastrum coromandelianum (L.) Garcke. A coarse erect herb sometimes a meter high; pubescence consisting of closely appressed, 4-rayed hairs, 2 of the rays directed forward and 2 backward; flowers small, buff, borne in the axils of the leaves and in clusters at the ends of the branches; fruit of small dry carpels.—An inconspicuous weed of the Progreso region, not noted about Lancetilla; widely distributed in Central America. Called "escobilla" in Panama.

MALVAVISCUS Cav.

The species of *Malvaviscus* are shrubs or small trees with narrow or broad, 3–5-nerved leaves which are toothed and often lobed. The flowers, which are solitary or clustered, have a large calyx surrounded by numerous narrow bractlets; their petals are of various shades of red, and are erect and more or less coherent into a long narrow corolla. The fruit is fleshy, becoming red or yellow at maturity. The various species have been introduced into cultivation in the north, and are often grown for ornament under the name *Achania.* Several species, most of which can not be separated very satisfactorily, are frequent

in Central America, being known usually under the name "manzanita" or "manzanilla."

Malvaviscus Conzattii Greenm., a Mexican species, is planted at Lancetilla Station. It is little if at all superior to the native *M. grandiflorus*, to which it is closely related. It differs chiefly in having the bractlets about the calyx somewhat dilated upward, those of *M. grandiflorus* being narrow throughout.

Malvaviscus Cutteri Standl. *Plate XLVII.* A shrub 1.5–4.5 meters high; leaves very large, 20–30 cm. long or more, coarsely hairy; flowers densely clustered, the calyx and bractlets hairy; petals 5 cm. long, pale red.—Frequent in wet forest above Lancetilla; known only from this locality. This plant is named for Mr. Victor M. Cutter, president of the United Fruit Company. It is a well-marked species, easily distinguished from the other Central American species by the large size of the leaves. The plant is much handsomer than the more common forms, and is well worthy of cultivation.

Malvaviscus grandiflorus HBK. *Quesillo.* A shrub or small tree 1.5–4.5 meters high; leaves small, green, and only very slightly hairy, narrow or broad, sometimes shallowly lobed; flowers few, often solitary, scarlet or pale red; fruit pale red, orange, or white.—Frequent almost everywhere in thickets and wooded swamps; widely distributed in Central America and Mexico. At Progreso I was told that the leaves—presumably their infusion or decoction—were employed as a remedy for fevers.

PAVONIA Cav.

Pavonia paniculata Cav. A large coarse herb, more or less pilose with long spreading hairs; leaves palmately 5–7-nerved, shallowly lobed; bractlets numerous at the base of the calyx; petals yellow, 1.5 cm. long, the flowers showy; carpels of the fruit unarmed. —Occasional in thickets; widely distributed in tropical America.

Pavonia rosea Schlecht. *Mozote.* A coarse erect herb or shrub, usually about a meter high; leaves oblong or obovate-oblong, acute, toothed, not lobed, green and nearly glabrous but with fine scattered branched hairs; flowers in short racemes, the pink petals 1 cm. long; carpels of the fruit each with 3 long barbed spines.—A common weed in thickets and waste ground; generally distributed in Central America. The plant bears the same vernacular name in Panama and Guatemala. The barbed spines enable the fruit to adhere to clothing and to the skins of animals, so that it is widely distributed.

Pavonia spicata Cav. A shrub 2–3 meters high; leaves heart-shaped, green and nearly glabrous, long-pointed, nearly entire; flowers in long racemes; calyx surrounded by linear or lanceolate bractlets; petals pale green or greenish white, nearly 2 cm. long.—Frequent in thickets along the beach or in mangrove swamps, and confined to such situations; rather widely distributed in tropical America. The plant is easily recognized by its bell-shaped flowers of peculiar coloring.

SIDA L.

The Sidas form a large genus that is well represented in Central America, mostly by weedy plants, which are usually herbs but not infrequently shrubs. Commonly the flowers are small and not showy; the calyx has no bractlets at the base; the fruit consists of few or numerous small dry carpels which sometimes are sharp-pointed.

Sida acuta Burm. *Malva, Escoba.* An herb or shrub, seldom more than 60 cm. high, bright green and nearly glabrous; leaves small, short-stalked, acute, toothed, obtuse at base; flowers small, deep yellow or white.—A common weed in thickets and waste places; one of the most common weedy plants of Central America. Usually called "escobilla" in other regions. By the West Indians in Panama it is termed "broomweed" and "broom."

Sida cordifolia L. *Malva de playa.* A shrub about a meter high; leaves ovate, obtuse, subcordate at the base, densely velvety-hairy, coarsely toothed; flowers small, buff, in short racemes.—Common in thickets about Tela, usually near the beach; rather widely distributed in tropical America, but not very common in most parts of Central America. Called "escobilla" in Salvador.

Sida decumbens St. Hil. & Naud. A slender creeping herb; leaves heart-shaped, very asymmetric at the base, sharp-pointed, thin, green, nearly glabrous, coarsely toothed; flowers small, buff, on long slender stalks in the axils of the leaves.—Occasional in wet thickets.

Sida pyramidata Desp. A much-branched herb sometimes 1.5 meters high, very minutely but densely pubescent, green or grayish; leaves large, broadly heart-shaped, long-pointed, inconspicuously toothed; flowers very small, buff, in large panicles; calyx not angled as in most species of the genus.—Collected only in thickets at Progreso; widely distributed but not common in Central America. Called "malvita" and "escobilla blanca" in Salvador.

Sida rhombifolia L. *Malva, Escoba.* An erect herb or often a low shrub, sometimes more than a meter high but usually lower; leaves oblong or lanceolate, obtuse at the base, toothed, minutely pubescent, paler beneath; flowers small, on long stalks in the leaf axils, the petals buff, sometimes with a purple spot at base.—A common weed; widely distributed in tropical America, and one of the two or three most abundant plants of Central America. It is usually known under the name "escobilla." The plant is especially abundant in pastures, and its presence is generally a warning to be on guard against *garrapatas* or ticks, which are most plentiful in such places.

WISSADULA Medic.

Wissadula excelsior (Cav.) Presl. A slender shrub 2 meters high or less; leaves long-stalked, heart-shaped, entire, with long narrow tips, green above, covered beneath with a pale brownish felt; flowers small, pale yellow, panicled; fruit of 5 small dry carpels.—In wet thickets, infrequent; widely distributed in Central America.

BOMBACACEAE. Cotton-tree Family

The family consists of small or usually large trees with alternate, chiefly palmately compound leaves (simple in some of the genera listed here), pubescence, when present, consisting of mostly stellate hairs. The flowers are often large and showy, with 5 petals; the stamens are 5 to many and either free or united into a tube. The fruit is dry or fleshy, 2–5-celled, and either dehiscent or indehiscent, with 2 to many seeds in each cell. The family is not so well represented in this region as in some other parts of Central America.

CEIBA Medic.

Ceiba pentandra (L.) Gaertn. *Ceiba.* A giant tree, with large buttresses, bark gray or greenish, smooth but covered with short conic spines; leaves palmately compound, with 5–7 or more narrow, long-pointed, nearly or quite glabrous leaflets which are pale beneath; flowers small, only 3–3.5 cm. long, the petals white or pink; fruit a large oblong capsule about 10 cm. long, the brown seeds imbedded in masses of silky "cotton."—A common tree of the region, frequent near the coast and also plentiful on the hills, where there are some giant trees; widely distributed in America and also in Asia and Africa. The ceiba is one of the largest trees of Central America, the trunks often reaching an enormous size and the crowns very broad and spreading. The tree is well known to almost every Central

American, and plays a large part in legend and literature. The wood is pinkish white to ashy brown, light and soft but firm and tenacious, weighing about 27 pounds per cubic foot, coarse, easy to cut, tough and strong for its weight, and not durable. It is not used locally, but it has been employed in some regions for dugout canoes and rafts. It has been suggested that it is suitable for paper pulp and for crates and packing boxes.

The silky fiber surrounding the seeds is sometimes employed in Central America for stuffing pillows and cushions. Large quantities of it are exported from the East Indies and West Africa under the name "kapok" or "kapok fiber" for use in stuffing mattresses, pillows, life preservers, and other articles, and it has become an important article of commerce. The oil of the seeds has been utilized for illumination and for the manufacture of soap.

HAMPEA Schlecht.

Hampea stipitata Wats. *Majao.* A tree 5–12 meters high with nearly smooth bark; leaves large, long-stalked, ovate, nearly glabrous, entire, paler beneath; flowers on long pedicels, small, white, clustered in the leaf axils; fruit a globose, somewhat woody capsule slightly over 1 cm. in diameter, sage green, covered with a minute stellate pubescence, opening by 3 valves.—Common in wet forest and thickets; occurring also in Guatemala. The name "majao colorado" is used in some localities of Honduras. The wood of this tree is very light and soft.

OCHROMA Sw.

Ochroma limonensis Rowlee. *Guano. Balsa.* A medium-sized tree with open spreading crown composed of few branches; leaves very large, long-stalked, rounded-ovate, usually shallowly lobed, green above, pale beneath and covered with a fine dense pubescence; flowers 10–15 cm. long, whitish; fruit a narrow capsule containing numerous seeds imbedded in brownish "cotton."—Common in clearings and pastures; ranging southward to Panama. Several other species of the genus are widely distributed in tropical America, and all of them are much alike in properties and general appearance. The characters upon which the species have been separated seem to be rather inconstant and of little systematic importance. Although the name "guano" is used for the trees in this part of Honduras, "balsa" is the term generally employed in Central America. The fiber obtained from the capsules of balsa trees is often used like that of the

ceiba. The most interesting product of the tree is its wood. This is lighter than cork, weighing only 7.5–12 pounds per cubic foot; it is soft and spongy, pinkish white or pale reddish, sometimes brownish, with rather silky luster, straight-grained, coarse, and perishable when exposed. Large amounts of balsa wood have been exported, to be used for insulation of refrigerators, life preservers, submarine mine floats, hydroplane pontoons, and other purposes. The wood is so light that a strong man can lift a large log easily to his shoulder, and it is really uncanny to see on the docks the loading of the logs for export. The trees grow with great rapidity, and often spring up like weeds on land that has been cultivated and abandoned.

PACHIRA Aubl.

Pachira aquatica Aubl. *Zapotón. Provision tree.* A small tree, usually not over 10 meters high, with pale smooth bark; leaves digitately compound, with 5–7 narrow leaflets which are short-pointed, nearly glabrous, entire, green above and pale beneath; the flowers have a short cuplike calyx, narrow, brownish and greenish petals about 30 cm. long, and very numerous purple stamens; the fruit is ovoid, as large as a coconut, russet brown, containing numerous large brown seeds imbedded in whitish flesh.—Common in swamps about Tela, sometimes growing in rather dry ground; widely distributed in tropical America. The name "pumpunjuche" is reported from Honduras. The tree is known in Guatemala as "sunzapote"; in Salvador as "shila blanca." The seeds, called "saba nuts" in Nicaragua, are sometimes roasted and eaten in certain localities of Central America.

Frequently this tree flowers and fruits about Tela when not more than 2–3 meters high. The trees are so heavily laden with the huge fruits that it is difficult to understand how they can support such a load. The flowers are very showy and attractively colored. Several of the trees are in sight from the bridge across the river at Tela, and many others occur in the swamps about the town.

QUARARIBEA Aubl.

Quararibea Fieldii Millsp. *Coco mamá.* A tree 9–12 meters high, the branches radiately arranged; leaves short-stalked, oblong or lanceolate, glabrous, entire, with long tapering tips; flowers borne in the axils of the leaves, nearly sessile, the calyx very narrow, about 2.5 cm. long, the narrow white petals almost twice as long; fruit

tomentose, hard and not opening, 3 cm. long.—Frequent in wet hillside forest; ranging to Yucatan.

STERCULIACEAE. Cacao Family

The Sterculiaceae are herbs, shrubs, or trees, often with branched pubescence. The leaves are alternate, simple in the species listed here, and provided with stipules. The flowers are small or large, with a 5-lobed calyx, and with 5 petals (rarely none) which are sometimes clawed, and either free or united with the stamen tube. The fruit is variable, usually dry but sometimes fleshy. A few genera besides those listed here occur in Central America.

BYTTNERIA L.

Byttneria aculeata Jacq. *Zarza hueca.* A shrub, armed with short sharp recurved prickles, the branches long and often clambering over other shrubs; leaves lanceolate to broadly ovate, short-stalked, long-pointed, entire or toothed, often with curved prickles along the midrib on the lower surface; young leaves often blotched with silver; flowers very small, purplish brown, clustered in the leaf axils; fruit a small 5-celled burlike capsule covered with long soft green spines.—Abundant in thickets, especially on cleared land, often invading banana plantations and becoming a troublesome weed; widely distributed in tropical America, and common in most parts of Central America. Known in Panama as "espina hueca," "zarza," "rabo de iguana," and "rangay"; in Costa Rica as "uña de gato." The name "zarza hueca" alludes to the fact that the young stems are hollow. The plant is a pest wherever it grows, for its interlaced branches, covered with sharp prickles which tear the flesh painfully, form impenetrable thickets.

GUAZUMA Adans.

Guazuma ulmifolia Lam. A small or medium-sized tree with spreading or rounded crown; leaves short-stalked, oblong to ovate, toothed, covered with a fine pale stellate pubescence; flowers small, in axillary clusters, the petals pale yellow; fruit an oval woody capsule 2–4 cm. long, covered with short stout sharp hard protuberances.—Found only at Progreso, where no vernacular name was known for it; one of the commonest trees of many parts of Central America. The name "cablote" (caulote?) is reported from Honduras. Called "guácimo" in Panama and most other parts of Central America. Known in Salvador as "caulote" and "chicharrón," in Nicaragua as

"guacimillo." In British Honduras the tree bears the name of "bastard cedar."

The fruit is black at maturity, and filled with a pulp having an agreeable sweet flavor. It is often eaten by children, but is not very pleasant because of the numerous large hard seeds. Stock are fond of the fallen fruits and also browse upon the young branches. The tough fiber of the bark has been employed for making rope and twine, and the mucilaginous sap for clarifying sirup in the manufacture of sugar. The wood is light pinkish, without distinctive odor or taste, rather light but tough and strong, fairly straight-grained, rather coarse, fairly easy to work, and not durable. It is sometimes used for charcoal and even for construction purposes.

MELOCHIA L.

The local Melochias are erect herbs, sometimes becoming somewhat woody, with fine stellate pubescence. The leaves are slender-stalked and toothed. The small flowers are clustered in the leaf axils, and the fruit is a small pyramidal capsule.

Melochia lupulina Sw. A slender herb about a meter high; leaves ovate, long-pointed, obtusely toothed, green above, paler and finely pubescent beneath; petals white; calyx much enlarged and bladdery in fruit.—Collected only at Quebrada Seca, in a wet thicket; widely distributed in Central America.

Melochia pyramidata L. Plants bushy, sometimes 1.5 meters high; leaves oblong to ovate, green, nearly glabrous; petals bright purple; calyx not enlarged in fruit, small and inconspicuous.—Found only near Guaymas, on an open weedy bank; a common weed in many parts of Central America. Known in Salvador as "coralillo," "escobilla colorada," "escobilla," and "escobilla morada."

STERCULIA L.

Sterculia apetala (Jacq.) Karst. *Castaño. Panama tree.* A large tree, sometimes attaining a height of 40 meters, with a thick trunk and a broad dense crown; leaves long-stalked, often 30–50 cm. wide, with 3 or 5 broad entire lobes, nearly glabrous or softly pubescent beneath with stellate hairs; flowers large, borne in panicles in the leaf axils; calyx reddish and woolly outside, dark red and greenish yellow within, bell-shaped, 5-lobed; petals none; fruit a cluster of 5 large pods containing large brown seeds resembling chestnuts.—Frequent about Progreso, and less common at Tela;

widely distributed in Central America. The tree is known as "castaño" in most parts of Central America. In Panama it is called "panamá," and it is from this tree that the republic derives its name. The interior of the pod is covered with stiff hairs which penetrate the skin readily and cause irritation and itching. The seeds, known as "castañas," are edible. The wood is useful for construction purposes.

THEOBROMA L.

Theobroma Cacao L. *Cacao.* A small tree; leaves oblong or obovate, large, short-stalked, long-pointed, entire, nearly or altogether glabrous; flowers small, pinkish, borne in small clusters along the trunk and larger branches; fruit a large fleshy capsule filled with firm juicy flesh and large brown seeds.—Common in the hill forests; cultivated in Central America, and wild in some regions. Cacao is to all appearances truly indigenous about Lancetilla, and occurs plentifully everywhere over the hills and even in the low flat forests. It is quite unusual to find it thus in Central America. Sometimes, it is true, it is found in forests, but usually even in such a place it has the appearance of having been introduced by accident or as the result of previous cultivation. The native plant of the Tela region differs little if at all from the usual cultivated form.

Cacao, from which chocolate and cocoa are made, is grown extensively in some regions along the Atlantic coast of Central America, but not so extensively, probably, as formerly, owing to competition from the Old World tropics. Central American cacao long has held an enviable position in foreign markets, because of its superior quality. The use of cacao was well known to the aboriginal inhabitants of tropical America, at least to those of Mexico and Central America, and most of the chronicles of the early explorers contain detailed accounts of the modes of preparation and utilization. The seeds served among some of the aborigines as coin, and in some localities this use continued until the middle of the nineteenth century. When employed as currency the seeds often were given a value much greater than their commercial value when sold for beverage purposes.

Although cacao is grown in many parts of Central America, it is astonishing to find that the chocolate sold in the shops usually is imported from Europe or from the United States, in spite of the ease with which the refined product may be obtained.

Several other species of Theobroma besides *T. Cacao* are native or in cultivation in Central America. The patashte cacao of Guatemala is the product of *T. bicolor* Humb. & Bonpl.

The wood of *Theobroma Cacao* is light and soft but firm. It is not used in Central America.

WALTHERIA L.

Waltheria americana L. An erect herb or shrub about a meter high; leaves oblong to ovate, short-stalked, obtuse, finely toothed, densely grayish-tomentose on both sides with stellate hairs; flowers small, pale yellow, in dense headlike clusters in the axils of the leaves, the clusters usually stalked; fruit a small 1-celled capsule.—Occasional along the beach at Tela; widely distributed as a weed in tropical America, and very common in some regions. Called "friegaplato" and "mala sombra" in Panama; "escobilla" and "hierba del buey" in Salvador.

DILLENIACEAE. Dillenia Family

The plants of the Dillenia family are trees or shrubs, often climbing, with alternate, simple, entire or toothed, short-stalked leaves which are usually very rough, and no stipules. The flowers are mostly panicled or clustered and have 3–5 imbricated sepals and numerous free stamens. The fruit consists of 1–5 dry carpels which split lengthwise at maturity. The seeds ordinarily are provided with a fleshy aril.

DAVILLA Vand.

Davilla rugosa Poir. A large woody vine; leaves stalked, oblong to broadly elliptic, rounded to acute at the tip, entire or nearly so, very rough to the touch; flowers in small, terminal or axillary panicles; sepals unequal, the inner ones enlarged and closely enclosing the fruit; petals yellow, soon withering or falling; fruit of a single one-seeded carpel.—Frequent in swamps and thickets; widely distributed in tropical America. In Nicaragua the plant is said to be called "hoja chigüe." The seeds are reported to have violent emetic-cathartic properties.

DILLENIA L.

Dillenia indica L. A medium-sized tree with long, obovate-oblong, coarsely toothed leaves; flowers large, pure white, with bright yellow stamens; fruit very large, hard and green, consisting in large part of the enlarged and fleshy sepals.—Trees of good size are growing at Puerto Arturo; native of tropical Asia. The fruits, which are as sour as rhubarb, are eaten in India. The flowers are very handsome and showy.

DOLIOCARPUS Roland

Doliocarpus dentatus (Aubl.) Standl. A large woody vine; leaves mostly obovate, acuminate, coarsely toothed, glabrous or nearly so and smooth to the touch; flowers small, clustered usually on naked branches; fruit globose, 1 cm. in diameter, glabrous.—Frequent in thickets, forest, and swamps; also in Panama and northern South America.

TETRACERA L.

The Tetraceras are large woody vines with oblong to obovate, short-stalked, toothed or nearly entire leaves which are rough on one or both sides. When dried the leaves normally have a grayish tint. The flowers are small and arranged in terminal or axillary panicles; they have 4–6 spreading sepals and the same number of petals. The fruit consists of 2–5 carpels which are distinct or nearly so. The two species growing here are alike in general appearance, differing only in details of the flowers.

Tetracera oblongata DC. Sepals glabrous on the inner surface.—Frequent in wet forest; rather widely distributed in Central America.

Tetracera volubilis L. Sepals densely silky-pubescent on the inner surface.—Collected in wet lowland forest at La Fragua; widely distributed in tropical America. Called "chumico" and "pasmo de sol" in Panama; "hoja chigüe" in Nicaragua; "raspa-guacales" in Costa Rica. The leaves of this and some other plants of the family are rough like sandpaper, and in Central America they are sometimes used as a substitute for that article in polishing objects made of wood or metal.

The Tetraceras and other vines of this family are well known in tropical America as water vines (see under *Vitis*).

ACTINIDIACEAE. Actinidia Family

SAURAUIA Willd.

The Saurauias are large shrubs or small trees, their pubescence usually of bristles or chafflike scales. The leaves are alternate, simple, without stipules, and usually serrate. The white flowers, in stalked axillary panicles, have 5 sepals, 5 petals which are united at base, and numerous stamens adnate to the base of the corolla. The fruit is berrylike, 3–5-celled, and contains numerous fine seeds embedded in the thin pulp. The genus is a large one, composed of

250 species or more, and it is well represented in Central America, especially in the mountains.

Saurauia Englesingii Standl. A tree about 7.5 meters high with smooth cinnamon-brown bark; leaves oblong-obovate, large, short-stalked, obtuse or acute, furnished on both surfaces with abundant bristles which are stiff and rough to the touch; panicles many-flowered, equaling or shorter than the leaves; flowers about 1 cm. broad.—Occasional in wet thickets or in forest; occurring also in Nicaragua.

Saurauia pauciserrata Hemsl. A tree 4.5–7.5 meters high; leaves short-stalked, oblanceolate-oblong, green and nearly glabrous, obscurely toothed; flower panicles much shorter than the leaves; fruit nearly 1 cm. in diameter, pinkish white.—Occasional in wet thickets. The fruit is very juicy and sweet; its pulp, which looks much like the white of an egg, is good to eat. The fruits are sometimes gathered and sold in the markets of Salvador, where the tree is called "capulín," "capulín montés," "alais," and "cresta de gallo."

MARCGRAVIACEAE. Marcgravia Family

Epiphytic or climbing shrubs, the leaves alternate, entire, thick and fleshy, the juvenile ones often very unlike the adult forms; inflorescence terminal, racemose, pendent, with often greatly modified, nectar-bearing bracts; flowers perfect, with 5 imbricated sepals, the 5 petals more or less united and falling off as a cap; stamens 5–40; fruit indehiscent, globose, often fleshy, 5–many-celled.

MARCGRAVIA L.

Marcgravia nepenthoides Seem. *Cachimba.* A very large, woody, epiphytic vine; leaves nearly sessile, oblong, acuminate; inflorescence umbel-like, the flowers long-pediceled; nectaries large, inverted helmet-shaped, pendent like dippers, reddish.—Frequent in the mountain forests, often climbing to the tops of the tallest trees; occurring also in Nicaragua. The stems are sometimes 20 cm. in diameter. The nectaries of these plants contain a sweet liquid which is attractive to hummingbirds. The name *cachimba* (tobacco pipe) is given in allusion to the shape of the curious nectaries.

SOUROUBEA Aubl.

Souroubea guianensis Aubl. A large woody vine, glabrous; leaves oblong-obovate, rounded at the apex; flowers in elongated

racemes, short-pediceled; bracts helmet-shaped, borne at the apex of the pedicel, about 1 cm. long.—On trees in wet forest; extending to the Guianas.

OCHNACEAE. Ochna Family

The genus *Sauvagesia* is represented in Honduras by *S. erecta* L., a slender herb with small pink flowers which grows in the mountains of the interior.

OURATEA Aubl.

Ouratea Wrightii (Van Tiegh.) Riley. A glabrous shrub 1–1.5 meters high; leaves alternate, lance-oblong, thick and leathery, lustrous, long-acuminate, finely toothed, on very short petioles; stipules 2 at the base of each petiole; flowers in narrow dense panicles at the ends of the branches, with 5 sepals and 5 bright yellow petals nearly 1 cm. long; stamens 10; fruit of a few juicy black drupes inserted on an enlarged red disk.—In thickets and wooded swamps along the coast; ranging to Panama. The shrub is a showy one because of its brightly colored flowers. The young leaves often are tinged with bronze.

GUTTIFERAE. Clusia Family

The representatives of this group are glabrous shrubs or trees with resinous, usually yellow or milky sap. The entire leaves have no stipules and are opposite and generally thick and leathery, or when fresh somewhat fleshy. The flowers are often large and showy, frequently of separate sexes, with 2–6 or more sepals, as many petals, and numerous stamens. The fruit is usually fleshy and often edible.

CALOPHYLLUM L.

Calophyllum Rekoi Standl. *María.* A tree, often very large, with pale, nearly smooth bark; leaves short-petioled, oblong to elliptic, acute or acuminate, thick and leathery, usually shining, with very numerous lateral veins; flowers white, fragrant, 1 cm. broad, in short racemes; fruit globose, fleshy, 4–5 cm. in diameter.—Common in forests; ranging to Salvador and southern Mexico. Called "Santa María" and "palo de María" in some parts of Honduras. Known in Salvador by the names "barillo," "Marío," and "varillo." The wood is reddish, moderately hard, fairly easy to work, although inclined to warp, and takes a high polish. It is highly esteemed in Central America for general construction purposes. Cayucos, or dugout canoes, are said to be made of it in

Honduras. In some regions the tree is planted for shade, a purpose for which it is eminently adapted because of its large and dense crown and persistent leaves.

CLUSIA L.

The Clusias are common in many parts of Central America, and there are numerous species of them, especially in Costa Rica and Panama. They are glabrous trees which often, especially in youth, are epiphytic upon other trees. The leaves are very thick and leathery, when dried sometimes hard and resembling pasteboard, their veins often very numerous. The flowers are either white or pink, with thick fleshy petals. The fruit is a leathery capsule which splits into several segments at maturity, the divisions radiating like the points of a star.

Clusia flava Jacq. An epiphytic or terrestrial shrub, or perhaps occasionally a tall tree; leaves very thick, wedge-shaped, broadly rounded at the apex, mostly 10–12 cm. long, short-petioled; flowers few, the petals cream-colored; sap milky.—Frequent in forests and in coastal thickets; widely distributed in tropical America.

Clusia mexicana Vesque. Usually a shrub but sometimes perhaps a small tree; leaves thick, dark green, drying rather thin, oblong to elliptic, acute, slender-petioled.—Occasional in wet thickets and in forest, sometimes growing on large rocks; extending to Salvador and Mexico. Known in Salvador by the names "icaco montés," "manzana montés," and "matapalo."

RHEEDIA L.

Rheedia edulis (Seem.) Triana & Planch. *Caimito, Caimito de montaña.* A tree often 15 meters tall or more, with smooth brownish trunk and no buttresses; leaves short-petioled, narrowly oblong or lance-oblong, 11–19 cm. long, acuminate, thick and leathery, with numerous lateral veins; flowers cream-colored, clustered in the leaf axils or on old naked joints, slender-pediceled, the petals about 6 mm. long; fruit olive-like, 2.5 cm. long, yellow, edible, containing 1 or 2 seeds surrounded by scant pulp.—Frequent in wet forests; ranging to Panama and southern Mexico. Called "jorco" in Costa Rica and "sastra" in Panama. Although the fruit is edible, it is of poor quality, and is little esteemed.

SYMPHONIA L. f.

Symphonia globulifera L. f. A small or often very tall tree, the bark with yellow resin; leaves short-petioled, oblong, 7–11 cm. long, acuminate, obtuse or acute at the base, thick, glabrous, with numerous veins, yellowish green when dried; flowers globose, red.—Frequent in forests and in wooded swamps; widely distributed in tropical America. Called "leche amarilla" in some parts of Honduras, "cerillo" in Panama, and "barillo" in Guatemala. Known as "Waika chewstick" in British Honduras. The wood, which is greenish brown, moderately hard, coarse-textured, and finishes smoothly, is used to some extent for construction purposes. The resin was employed by some of the Central American Indians for caulking boats and for torches. The tree is said to be used in domestic medicine in the Tela region.

BIXACEAE. Anatto Family

BIXA L.

Bixa Orellana L. *Achote. Anatto.* A small tree or often only a shrub; leaves alternate, on long slender stalks, ovate, long-acuminate, thin, minutely brown-scaly beneath; flowers rather large, white or pinkish, in compact terminal panicles, the 5 petals 1.5–2.5 cm. long; fruit a globose or ovoid capsule 2–4 cm. long, usually covered with long flexible spinelike bristles, but sometimes quite unarmed.—Planted frequently, and escaped here and there, but not native; planted generally in Central America, and native along the Pacific slope. The numerous round seeds of the capsule are imbedded in orange-red pulp. From this is obtained anatto dye, which formerly was much employed by the aborigines for painting their bodies, partly for ornament and partly to protect them against the attacks of insects. It is used commonly in Central America for coloring rice and other dishes. Large amounts of it have been exported to Europe and the United States, where it is used for dyeing textiles and for coloring butter and cheese, oils and varnishes, candies, and soap.

The pulp is employed in domestic medicine as a remedy for cutaneous diseases, and is applied to burns to prevent the formation of scars. The tough fiber of the bark is utilized sometimes for making rough cordage. The wood is pinkish yellow, porous, and soft, and too small to be of use. The names "achote" and "achiote," of Aztec origin, are used generally throughout Central America for the tree.

The specific name was given in honor of Orellana, treacherous associate of Pizarro, who gained eternal fame by his discovery of the Amazon.

VIOLACEAE. Violet Family

The tropical American representatives of this family are very unlike the northern violets in general appearance, although resembling them in flower structure. The ones here listed have simple leaves with stipules; perfect flowers with 5 sepals, petals, and stamens; and a fruit consisting of a 1-celled capsule which opens by 3 valves. The genus *Viola* is represented in the mountains of Central America by several species.

HYBANTHUS Jacq.

Hybanthus riparius (HBK.) Standl. A weedy annual herb 30–60 cm. high, branched, sparsely pubescent with short hairs; leaves alternate, short-petioled, lanceolate or ovate, acuminate, finely toothed; flowers 5 mm. long, greenish, solitary in the leaf axils; capsules 5 mm. long.—Occasional on open banks or in thickets, but rather scarce; widely distributed in tropical America. Called "hierba del rosario" in Salvador. The names *Calceolaria* and *Ionidium* have been applied to the genus *Hybanthus*.

RINOREA Aubl.

Rinorea guatemalensis (Wats.) Bartlett. A slender shrub or tree 2–7.5 meters high, with slender stiff branchlets; leaves opposite, short-stalked, elliptic-oblong, mostly 7–13 cm. long, acuminate, acute at the base, obscurely serrate, glabrous or nearly so; flowers white, 5–6 mm. long, in short racemes at the ends of the branches or in the leaf axils; capsules 2–2.5 cm. long.—Common in wet forest about Lancetilla; also in Guatemala.

VIOLA L.

Viola odorata L. *Violeta. Sweet violet.* Sometimes planted in gardens or grown in pots. Native of Europe.

Viola tricolor L. *Pensamiento. Pansy.* Grown for ornament. A European plant.

FLACOURTIACEAE. Flacourtia Family

The Central American Flacourtiaceae are shrubs or trees, sometimes armed with spines, and with simple, alternate, entire or toothed,

petioled leaves which often are provided with translucent glands. The stipules are minute or absent. The small flowers are perfect or of separate sexes, and have a 3–7-lobed calyx or 3–7 distinct sepals, the petals being of the same number as the calyx segments, or sometimes none. The fruit is a one-celled capsule or berry. The family consists of a rather miscellaneous group of plants which have little general resemblance to each other.

CARPOTROCHE Endl.

Carpotroche platyptera Pittier. *Plate XLVIII.* A shrub or small tree 2–5 meters high, with few branches, often simple; leaves short-stalked, oblong-oblanceolate, very large, usually about 30 cm. long, commonly with a long narrow tip, long-tapering to the base, coarsely toothed, finely soft-pubescent beneath or occasionally almost glabrous; flowers clustered in the leaf axils, small, greenish white; fruit globose, 5 cm. in diameter or larger, with several broad thin vertical wings.—Common in wet forest, especially on the hills; ranging southward to Costa Rica. The plant is easy to recognize because of the peculiar form of its fruits.

CASEARIA Jacq.

The Casearias are shrubs or small trees, their leaves either entire or toothed, and nearly always conspicuously marked with translucent dots or lines. The small whitish flowers are arranged in clusters or umbels in the leaf axils or along the older branches; they have 4–6 calyx lobes, no petals, and 6–15 stamens. The fruit is a dry or fleshy capsule opening by 3 or 4 valves and containing several or many seeds which are subtended by fleshy arils.

Casearia aculeata Jacq. *Escambrón.* A densely branched shrub or tree 3–12 meters high, the branches often thornlike; leaves mostly elliptic or broadly ovate and 5–10 cm. long, abruptly and shortly blunt-tipped, irregularly and inconspicuously toothed, glabrous or nearly so; flowers greenish white, about 3 mm. long, clustered in the leaf axils; fruit about 8 mm. in diameter.—In thickets about Tela; often along the beach, or in pastures; widely distributed in tropical America.

Casearia arborea (L. Rich.) Urban. A shrub or small tree 3–6 meters high, nearly glabrous, unarmed; leaves short-petioled, narrowly oblong, long-acuminate, acute at the base, finely and inconspicuously serrate; flowers small, white, in short-stalked cymes in the

leaf axils; fruit red, 1 cm. long, sharply 3-angled, the seeds subtended by a red aril.—Frequent in wet thickets and in forest, especially along the banks of streams; occurring also in the West Indies. So far as I know, this species has not been recorded previously from Central America. The tree is rather conspicuous when loaded with the brightly colored fruits.

Casearia arguta HBK. *Plate XLIX.* An unarmed shrub or tree 2.5–7.5 meters high; leaves lance-oblong, long-acuminate, sharply and coarsely toothed, pubescent beneath along the nerves; flowers about 5 mm. long, creamy white, densely clustered on short pedicels in the leaf axils; fruit globose, more than 1 cm. in diameter.—Common in thickets and swamps; ranging to Colombia and Mexico. Known in Costa Rica as "palo María"; in Panama as "raspa-lengua"; in Guatemala as "guayabillo."

Casearia javitensis HBK. A shrub or tree 3–6 meters high, glabrous or nearly so; leaves oblong or lance-oblong, thick and leathery, shining, unevenly toothed; flowers small, white, clustered in the leaf axils or on naked branches; capsule about 1 cm. long.—In thickets along the beach near Tela, frequent; ranging from Mexico to South America. Called "maúro" in Panama.

Casearia sylvestris Sw. A tree 4.5–7.5 meters high, often with a very dense, spreading, dark green crown; leaves oblong or lance-oblong, long-acuminate, entire, conspicuously unequal at the base; flowers greenish white, pediceled, in very dense clusters in the axils of the leaves; fruit 3–4 mm. long, containing 2–6 seeds.—Common in wet thickets; widely distributed in tropical America.

HASSELTIA HBK.

Hasseltia mexicana (Gray) Standl. *Plate L.* A tree 4.5–6 meters high, or sometimes only a shrub; leaves stalked, oblong or oblanceolate-oblong, mostly 8–12 cm. long, abruptly obtuse-tipped, obtuse or acute at the base, irregularly serrate, 3-nerved at the base, glabrous or nearly so; flowers about 4 mm. long, with white petals and very numerous stamens, arranged in small dense panicles at the ends of the branches; fruit a small globose capsule 5–6 mm. in diameter, minutely pubescent, not opening, usually 1-seeded.—Common in thickets; ranging to southern Mexico. One other species of the genus occurs in Central America, from Nicaragua to Panama.

LUNANIA Hook.

Lunania piperoides Standl. A slender tree 6–9 meters high with smooth pale bark; leaves short-petioled, oblong to oblong-ovate or narrowly oblong, long-acuminate, obtuse at the base, conspicuously 3-nerved from the base, sparsely hairy beneath, entire; flowers small, greenish white, arranged in long slender racemes, these in small panicles at the ends of the branches; capsules pale red, about 5 mm. long.—Frequent in wet forest on the hills above Lancetilla; known only from this region. The genus is unknown elsewhere in Central America.

ONCOBA Forsk.

Oncoba laurina (Presl) Warb. A tree 6–9 meters high; leaves long-stalked, oblong to narrowly ovate, 12–30 cm. long, long-acuminate, obtuse or rounded at the base, glabrous; flowers small, white, in panicled racemes at the ends of the branches; fruit globose, about 1 cm. in diameter, covered with long soft spines, containing 1–4 seeds and red pulp.—Noted only in wooded swamps about Triunfo; ranging to Colombia. Called "guavo cimarrón" and "carbonero" in Panama. The hard heavy yellow wood is said to take a fine finish. An African species of *Oncoba* yields an oil similar to chaulmoogra oil, which is said to be effective in the treatment of leprosy.

XYLOSMA Forst.

The genus is represented in Central America by several species of shrubs and trees which are easily recognized by the fact that their trunks are armed with large much-branched spines, similar to those of the honey locust of the United States. The small flowers have no petals, and the two sexes usually are borne upon separate plants. The fruit is a 2–8-seeded berry. At least one other species of the genus grows in the interior of Honduras.

Xylosma sylvicola Standl. *Plate LI.* A slender shrub or tree 2–6 meters high, the grayish trunk armed with much-branched spines; leaves short-petioled, elliptic or lance-oblong, 7–10 cm. long, thin, long-acuminate, coarsely serrate, glabrous or nearly so; flowers pale green, pediceled, clustered in the leaf axils; fruit 7–8 mm. long.—In wet forest on the hills above Lancetilla; known only from this region.

ZUELANIA A. Rich.

The genus is represented in Central America and Mexico by a single species.

Zuelania Roussoviae Pittier. *Sangre de playa, Palacio.* A shrub or tree 3–9 meters high; leaves oblong or narrowly oblong, usually 15–25 cm. long, acute or acuminate, unequal at the base and rounded or even subcordate, inconspicuously serrate, green and nearly glabrous above, densely soft-pubescent beneath; flowers small, whitish, in dense lateral clusters; fruit a fleshy capsule 3.5 cm. in diameter.—In wet forest and thickets, sometimes growing close to the beach; ranging from Mexico to Panama. Called "caraño" in Panama, where the gum issuing from the trunk is employed as a vomitive.

PASSIFLORACEÆ. Passion-flower Family

PASSIFLORA L.

The passion-flowers are usually herbaceous vines, furnished with tendrils, but in some species the stems become somewhat woody. The alternate leaves are provided with stipules and often bear glands; their blades are entire, toothed, or variously lobed. The often showy flowers have 5 sepals and 5 petals or none. The fruit is pulpy and sometimes edible. The curious arrangement of the stamens and pistil, in association with other parts of the flower, in colonial days gave rise to various legends concerning the plants, upon which is based the English name "passion-flower," and the Spanish "pasionaria."

Passiflora ambigua Hemsl. *Granadilla, Granadilla de monte.* A large woody vine; leaves petioled, oblong or ovate-oblong, acuminate, entire, somewhat leathery; flowers large, the corolla whitish outside, pale purplish within, the stamens banded with violet and white.—Frequent in wet forest; also in Nicaragua. The plants often climb to the tops of the highest trees. The fruits were described to me as large and edible.

Passiflora biflora Lam. *Media-luna. Plate LII.* Usually a rather small, herbaceous vine; leaves shallowly bilobed, often much broader than long, glabrous or nearly so, with conspicuous glands near the base; flowers small, greenish white; fruits globose, 1.5 cm. in diameter.—Frequent in wet thickets; widely distributed in tropical America. Called "ala de murciélago" (bat-wing) and "calzoncillo" in Salvador, and "guate-guate" in Panama.

Passiflora choconiana Wats. An herbaceous vine; leaves pale beneath, deeply 3-lobed, the lobes entire, acute, glabrous or nearly so, the petiole provided with a few small stalked glands; flowers purplish, 5 cm. broad.—In wet forest; also in Guatemala.

Passiflora coriacea Juss. *Media-luna.* A large herbaceous vine, glabrous or nearly so; leaves leathery, transversely oblong, peltate, acute at each side; flowers small, green.—Frequent in wet thickets; widely distributed in tropical America. The leaves are heated and applied as poultices to sores and wounds. In Salvador the plant is called "murciélago" and "ala de murciélago."

Passiflora costaricensis Killip. A large herbaceous vine; leaves slender-petioled, slightly longer than broad, shallowly 2-lobed at the apex, the short lobes acute, densely hairy on both surfaces.—In wet forest; ranging to Costa Rica.

Passiflora foetida L. *Granadilla.* A small ill-scented herbaceous vine, with abundant pubescence of gland-tipped hairs; leaves angled or shallowly lobed, toothed, densely pubescent; bracts at the base of the greenish flowers pinnately lobed.—A frequent weed in thickets about Tela; widely distributed in tropical America. Known in Salvador by the names "granadilla montés," "granadilla colorada," and "sandía de culebra." The small greenish fruits are sometimes eaten in Honduras.

Passiflora Hahnii Fourn. A large glabrous herbaceous vine; leaves ovate-rounded, peltate, pale beneath, very shallowly 3-lobed; stipules large and leaflike, toothed, the teeth tipped with long bristles; flowers small, greenish white.—In wet thickets about Progreso; ranging to Mexico.

Passiflora hastata Bertol. var. **nicaraguensis** Killip, ined. An herbaceous vine; leaves deeply 3-lobed, with numerous long gland-tipped hairs along the margin, the lobes entire, acute or obtuse; stipules divided into hairlike gland-tipped segments; corolla purplish white.—In thickets at La Fragua; also in Nicaragua.

Passiflora serratifolia L. *Granadilla.* A large herbaceous vine; leaves oblong to oval, acuminate, finely serrulate, sparsely pubescent beneath, the petioles furnished with numerous stalked glands; fruits pale yellow, edible.—In wet thickets about Tela; ranging to Mexico and southward to the Guianas.

Passiflora sp. *Granadilla.* A large herbaceous vine; leaves ovate or rounded-ovate, obtuse or short-pointed, large, pale beneath and pilose along the nerves.—In thickets near Lancetilla. The specimens are sterile, but according to Killip, who has examined the material here described, they probably represent an undescribed species.

CARICACEAE. Papaya Family

CARICA L.

Carica Papaya L. *Papaya. Papaw.* This tree is too well known to need description. It is planted abundantly in the Lancetilla region, and also grows half wild in many places, although evidently it is not native here. The papaya is one of the favorite fruits of Central America, partly, perhaps, because it is available at all seasons of the year, if properly treated. The fruits, which suggest somewhat a muskmelon, are often of excellent flavor, and usually they are liked by foreigners upon first acquaintance. The plants are either staminate or pistillate, the former, of course, producing no fruit. All parts of the plant contain a copious milky sap which contains a substance resembling in its action animal pepsin. On this account the fruit is believed to be an aid to digestion. Moreover, if the leaves are boiled with tough meat, the latter is rendered soft and tender. The fruits of wild plants are ordinarily small and of too inferior quality to be eaten. The name papaya is used universally in tropical America except in Cuba, where this fruit is called "fruta bomba." In Tela there was noted an old papaya tree that had several branches, a rare condition in this plant.

LOASACEAE. Loasa Family

GRONOVIA L.

Gronovia scandens L. A slender herbaceous vine, densely beset with stinging hairs, the hairs barbed at the tip; leaves alternate, petiolate, broadly cordate, deeply 5-lobed; flowers 1 cm. long, greenish yellow, arranged in stalked corymbs opposite the leaves; calyx of 5 united lobes, the 5 petals inserted on its throat; stamens 5; fruit dry, indehiscent, 1-seeded.—Noted only about Progreso, growing in weedy fields; widely distributed in tropical America. Known in Salvador by the names "Juan Caliente," "pica-pica," "chichicaste," "pan caliente," and "pegapega." The hairs penetrate the skin easily, causing intense pain and more or less inflammation.

BEGONIACEAE. Begonia Family

BEGONIA L.

The begonias are succulent herbs with alternate leaves which are provided with stipules. The often showy flowers are of two sexes, on the same or different plants, the staminate flowers having two opposite

sepals and numerous stamens. The fruit is a variously winged capsule. Other species of the genus grow in the mountains of Honduras, and additional ones are in cultivation about Tela as ornamental plants.

Begonia flexuosa C. DC. A slender erect annual usually less than 60 cm. high, nearly glabrous, with branched stems; leaves short-petioled, small, lance-oblong, long-acuminate, serrate; flowers few, small, greenish white; capsule small, the angles with very narrow wings.—Infrequent in forest; ranging to Panama.

Begonia glabra Aubl. A large glabrous vine, creeping up tree trunks by aerial roots; leaves petioled, mostly oval or broadly elliptic, rounded at the base, shallowly angled; flowers small, greenish white, in rather large cymes.—Occasional in wet forest, sometimes growing in swamps; widely distributed in tropical America.

Begonia nicaraguensis Standl.(?) Plants stemless, with a thick rootstock; leaves basal, long-petioled, broadly ovate, unequal and deeply cordate at the base, acute or acuminate, with short jagged lobes, loosely hairy beneath along the veins.—In wet mountain forest. Only sterile specimens were obtainable, and the specific determination is therefore very uncertain.

Begonia Popenoei Standl. *Pavana. Plate LIII.* A stemless herb with a rather slender rootstock; leaves long-petioled, broadly ovate, long-acuminate, nearly entire, unequal and deeply cordate at the base, densely hairy beneath; flowers white; capsule with a very long wing along one of its angles.—Frequent in wet forest on the hills above Lancetilla; known only from this region.

CACTACEAE. Cactus Family

The plants of this family are, for the most part, well known and easily recognized, although some of the tropical forms are quite different in general appearance from the more familiar cactuses found in the deserts of the southwestern United States. They all have thick and fleshy stems, usually more or less armed with clusters of spines, and the leaves are reduced to mere scales, which often fall at a very early stage in the development of the stems.

CEREUS L.

Cereus undatus Haw. Stems elongated, 3-angled, the angles undulate, the spines few and short, in distant clusters along the edges of the stems; flowers white, sometimes 30 cm. long; fruit red, 10–12

cm. in diameter, very juicy, edible.—Forming dense masses on trees in lowland forest; widely distributed in tropical America.

A few other species of *Cereus* almost certainly occur in the region.

EPIPHYLLUM Haw.

The plants of this genus are epiphytes with unarmed stems which are broad, flat, and comparatively thin, their margins more or less deeply crenate. The flowers are very large and showy, the fruits large, red or purple, tubercled, juicy, and edible.

Epiphyllum Phyllanthus (L.) Haw. Stems bright green, comparatively thin and flexible; flowers whitish, 25–30 cm. long, the tube 7–9 times as long as the limb.—On tree branches in wet forest; widely distributed in tropical America.

Epiphyllum strictum (Lem.) Britt. & Rose. Stems thicker, stiff and rigid; flowers 20–23 cm. long, white and pinkish, the tube about twice as long as the perianth segments; fruit globose, 4–5 cm. in diameter, full of small black seeds.—Frequent on trees or stumps; ranging from Panama to southern Mexico.

NOPALEA Salm-Dyck

Nopalea cochenillifera (L.) Salm-Dyck. *Tuna.* A shrubby plant, about 3 meters high, with large, flat, sparsely spiny joints; flowers small, red, the petals erect, the stamens longer than the petals.—Planted at Tela and Triunfo; native of Mexico. This species formerly was cultivated on a large scale in Mexico as a food plant for the cochineal insect, from which a handsome red dye was extracted. The industry has become nearly or quite obsolete since the perfection of synthetic dyes.

RHIPSALIS Gaertn.

Rhipsalis Cassutha Gaertn. Plants much branched, forming dense pendent masses from the branches of tall trees; stems terete, slender, only 3–5 mm. thick, without spines; flowers inconspicuous, whitish, the petals 2 mm. long; fruit a globose translucent white berry 5 mm. in diameter.—Frequent; widely distributed in tropical America.

LYTHRACEAE. Loosestrife Family

The Lythraceae are herbs or shrubs, the leaves mostly opposite, entire, and without stipules. The large or small, often showy, perfect flowers have 4–16 calyx lobes and petals, the petals being inserted in the throat of the calyx between its lobes. The fruit is a dry capsule.

CUPHEA Adans.

The Cupheas are herbs or small shrubs with small entire leaves. The flowers are commonly small and axillary, with 2 or 6 petals and 11 or 9 stamens, the calyx being tubular and often curved or spurred at the base.

Cuphea carthagenensis (Jacq.) Macbride. A low bushy-branched annual, sparsely bristly-hairy and somewhat viscid; leaves small, slender-petioled, mostly elliptic, acute; calyx 5 mm. long, strongly swollen.—A weed in garden at Lancetilla, probably introduced; not noticed elsewhere in the region; a common weed of Central America and widely distributed in tropical America. (*C. balsamona* C. & S.)

Cuphea calophylla C. & S. An erect perennial herb, sometimes somewhat woody, usually less than 30 cm. high; leaves nearly sessile, oblong to elliptic-oblong, acute or acuminate, rough-hairy; calyx tubular; petals small, rose-purple.—Occasional in fields and thickets about Tela; a common weed of Central America and Mexico.

Cuphea utriculosa Koehne. A slender, densely branched shrub about 30 cm. high, nearly glabrous; leaves linear or linear-oblong, obtuse or acute; petals small, lavender.—Occasional on rocks in streams; widely distributed in Central America and southern Mexico. This species is common in many parts of Central America, growing on stream borders or in shallow streams perched upon rocks, its roots always washed by the current.

GRISLEA Loefl.

Grislea secunda Loefl. A slender bushy shrub 2–2.5 meters high, sparsely and inconspicuously pubescent; leaves oblong or lance-oblong, acuminate, densely dotted beneath with small black glands; flowers clustered in the leaf axils, the petals and long exserted stamens bright red.—In a thicket at Las Flores Farm; noted also on the high mountains of the interior above Tegucigalpa; the plant is known from Honduras and from northern South America. Its isolation in Honduras is remarkable, but the plant may be found later elsewhere in Central America. It is so conspicuous, with its vividly colored flowers, that it is not likely to be overlooked.

LAWSONIA L.

Lawsonia inermis L. *Reseda. Henna.* A shrub or small tree with small obovate leaves and small, greenish, very sweet-scented

flowers.—Planted occasionally in gardens; native of Africa and Asia. The plant suggests privet in general appearance. In the Orient the leaves are employed for dyeing the hair and beard and for staining the hands and feet yellow, and a perfume is prepared from the flowers.

PUNICACEAE. Pomegranate Family

PUNICA L.

Punica Granatum L. *Granada. Pomegranate.* This native of the Mediterranean region is planted but rarely about Tela. It is cultivated commonly in the interior of Honduras for its fruit.

LECYTHIDACEAE. Brazil-nut Family

To this family belongs the Brazil-nut of commerce (*Bertholletia excelsa*), a native of Brazil, and several other trees which furnish edible nuts. The family is represented in Central America by comparatively few genera and species, although the number is increasing gradually as exploration progresses.

GUSTAVIA L.

Gustavia integrifolia Standl. *Jagüillo.* A tree 4–9 meters high or more, with few branches; leaves large and mostly clustered near the ends of the branches, alternate, elongate-spatulate, acute, entire, long-tapering toward the sessile base, glabrous or nearly so; flowers about 3 cm. broad, in short racemes; petals 4; stamens numerous.—Common in wooded swamps at low elevations throughout the region; occurring also in Nicaragua and probably in Guatemala. Called "irayol" in some parts of Honduras, although that name should apply to *Genipa caruto.* The tree is a conspicuous one because of its large leaves, and also because of the bright red coloring of the long stipules of the young branches. The wood is yellow, rather light, fairly hard, and coarse-textured. The flowers and fleshy fruits are clustered along the trunk and larger branches.

RHIZOPHORACEAE. Mangrove Family

The two representatives of this family occurring in the Tela region are very unlike in general appearance.

CASSIPOUREA Aubl.

Cassipourea elliptica Poir. A shrub or small tree, the leaves opposite, elliptic, acute or acuminate, comparatively thin but per-

sisting, entire or remotely toothed, glabrous; flowers small, whitish, 4–5-parted, clustered in the leaf axils, the petals hairy; fruit small, leathery, 3-seeded.—Common in swamps and thickets along the beaches; widely distributed in tropical America. Called "huesito" and "limoncillo" in Panama.

RHIZOPHORA L.

Rhizophora Mangle L. *Mangle. Mangrove.* A small or medium-sized tree with thin, brownish gray, shallowly furrowed bark; leaves opposite, short-stalked, very thick and leathery, dark green, glabrous, obtuse or pointed, with deciduous stipules; flowers few, in the axils of the leaves, stalked, the calyx leathery and 4-lobed, the 4 petals yellowish white, narrow, hairy; fruit conical, leathery, 2–2.5 cm. long; seed usually germinating in the fruit, the radicle growing downward and pushing out, becoming 25–30 cm. long before it falls from the tree and takes root in the mud.—Common along the coast, in some places forming extensive thickets; distributed along most coasts of tropical America, as far northward as Florida. In other parts of Central America the tree is sometimes called "mangle salado," "mangle gateador," and "mangle colorado."

The dark green mangrove swamps are always a conspicuous feature of the landscape as one approaches Central America by steamship. Viewed from a vessel they are very beautiful, but closer acquaintance disillusions one, for they usually grow in slimy mud of most repulsive appearance. The trees are often raised on large prop roots. At high tide these roots are exposed, but at low tide they are covered with water. Oysters often are found growing upon the roots. Mangroves are of great importance in land building, for their roots catch mud and debris brought down by the rivers and hold it, gradually pushing seaward and forming new land.

About Tela the wood of the mangrove is burned for charcoal, and it is used for construction purposes. The bark is used locally for tanning. The wood is dull red or reddish brown, very hard and heavy, and fine-grained. The charcoal burned from it is generally believed to be the best obtainable. Large quantities of the bark have been exported from the tropics to the North for use in tanning skins. The young shoots are reported to give a dye of red, olive, brown, or slate color, depending upon the salts used in association with them.

COMBRETACEAE. Combretum Family

The Combretaceae are trees or shrubs, sometimes scandent, their leaves opposite or alternate, entire, and without stipules. The

flowers are arranged in heads, spikes, or racemes, the calyx having 4 or 5 lobes which are valvate in bud, and the corolla consisting of 4 or 5 petals, or absent. The stamens are twice as many as the calyx lobes and inserted on the limb or base of the calyx. The fruit is dry or drupaceous, indehiscent, one-celled and containing a single seed.

BUCIDA L.

Bucida Buceras L. A tree about 6 meters high, branched to the ground, nearly glabrous, the branchlets often with 2 or 3 spines at the apex; leaves crowded at the ends of the branches, obovate or oblanceolate, obtuse or rounded at the apex, tapering to the base; flowers small, in stalked spikes in the axils of the leaves; fruit an ovoid drupe about 6 mm. long.—In swamps along the coast; widely distributed in tropical America. Called "bullet tree" in British Honduras. The wood is yellowish brown, hard, heavy, and close-grained. It is said to be durable, and in some regions it is used for construction purposes. The bark is sometimes employed for tanning.

COMBRETUM L.

Combretum coccineum (Aubl.) Engl. & Diels. A large woody vine; leaves opposite, short-stalked, oblong, acuminate, nearly glabrous; flowers in very long, stout, dense, leafy-bracted racemes, the whole flower 2 cm. long, the petals deep bright red.—Common in wooded swamps about Tela; ranging from Guatemala along the coast of Central America to the Guianas. Flowering in March. This is one of the most gaudily colored flowers of Central America, and when the vines are in full blossom they are certain to attract attention.

Combretum mexicanum H. & B. A large woody vine; leaves short-petioled, oval to broadly oblong, obtuse to acuminate, glabrous or nearly so; flowers very small, whitish, in dense panicled spikes, the petals about 2 mm. long; fruit 2–2.5 cm. long.—Frequent in wet thickets; extending to Nicaragua and Mexico.

CONOCARPUS L.

Conocarpus erecta L. *Button mangrove.* A shrub or small tree; leaves alternate, oval to lanceolate, 3–10 cm. long, acute or obtuse, usually glabrous or nearly so, with two small glands at the base; flowers very small, in dense conelike heads which are scarcely 1 cm. in diameter, these arranged in racemes at the ends of the branches

and in the axils of the upper leaves.—Frequent in thickets along the beach; widely distributed in tropical America, also in Africa; ranging northward to Florida. The wood is fine-grained, heavy, hard, and strong. In some regions it is used for construction purposes and for charcoal. Among the names applied to the tree are "zaragoza," "mangle piñuelo," "mangle torcido" (Panama); "botoncillo" (Salvador); "mariquito" (Costa Rica). The bark is reported to be rich in tannin.

LAGUNCULARIA Gaertn.

Laguncularia racemosa (L.) Gaertn. *Mangle. White mangrove.* A shrub or small tree, the bark thin, reddish brown, fissured into long scales; leaves opposite, stalked, oblong to oval, 3–7 cm. long, rounded at the apex, leathery, glabrous, the petiole bearing 2 large glands; flowers small, in clustered spikes, the calyx 2–3 mm. long, silky-pubescent; stamens 10; fruit a leathery 10-ribbed drupe 15 mm. long.—Common in mangrove swamps and in thickets along the beach; widely distributed in tropical America. Sometimes called white buttonwood. Called "mangle blanco" in Panama; in Costa Rica "palo de sal"; in Salvador "sincahuite." The wood is rather heavy, hard, strong, and yellowish brown. It is said to be durable, and in some regions it is used for construction purposes. The bark is rich in tannin.

TERMINALIA L.

The Terminalias are large or medium-sized trees, the alternate leaves often crowded at the ends of the branches. The small greenish flowers are arranged in long slender spikes and have 8 or 10 stamens and no petals. The drupaceous fruit is flattened, with acute edges, or sometimes it is appendaged with 2–5 wings.

Terminalia Catappa L. *Almendro. Indian almond.* A medium-sized tree with whorled branches; leaves obovate, 20–30 cm. long, abruptly short-pointed, tapering to the base, usually with a gland on each side of the midrib at the base, pubescent beneath with brown hairs or nearly glabrous; fruit compressed, sharp-edged, 4–6 cm. long. —Planted for shade and also growing half wild in thickets, probably on the sites of former dwellings; native of the Old World tropics. The tree is planted commonly in Central America, especially along the coast, because it thrives in sand and endures salt. The seeds are rich in oil and edible. The flesh of the fruit contains a red sap, and the leaves are often tinged with red or bronze just before they fall.

Terminalia Hayesii Pittier? *Guayabo, Membrillo.* A large or medium-sized tree, the young parts brown-pubescent; leaves obovate or oblanceolate, mostly 8–14 cm. long, acute or obtuse, long-tapering to the base, nearly glabrous; flowers greenish, in slender spikes; fruit bearing several broad thin wings.—Common in forests and clearings. Called "amarillo real" in Panama. The wood is light gray or yellowish, moderately hard and heavy, of medium texture, easy to cut, stiff and strong, taking a good polish, and apparently not very durable. In some adjacent regions the wood is reported as in use for construction and railroad ties. About Tela it is burned for charcoal, and the bark is employed for tanning. The names "naranjo" and "boladora" (voladora?) are in use in Honduras and Guatemala.

The Central American species of *Terminalia* are imperfectly understood because of the lack of adequate material for study. The specimens from the Lancetilla region are sterile, and their determination therefore is decidedly uncertain.

MYRTACEAE. Myrtle Family

The Myrtaceae are shrubs or small trees with opposite entire leaves and no stipules. The leaves usually are conspicuously dotted with oil glands, and when crushed they frequently have an aromatic odor. The perfect and regular flowers, variously arranged, are subtended by 2 bractlets, and they have a 4- or 5-lobed calyx, 4 or 5 petals, and numerous stamens. The fruit is a one-seeded drupe or a many-seeded berry.

EUGENIA L.

The Eugenias are shrubs or small trees. The white or whitish flowers are either small or large, and either axillary or terminal. They have 4 or 5 well-defined calyx lobes which persist upon the fruit. The ovary is 2- or 3-celled, but the fruit often contains only a single seed. The genus is a large one in the West Indies and in South America, but it contains comparatively few Central American representatives.

Eugenia axillaris (Sw.) Willd. A shrub or small tree, sometimes 7.5 meters high, the bark shallowly fissured; leaves elliptic or elliptic-ovate, acuminate, short-petioled, glabrous, paler beneath; flowers 3–4 mm. broad, in short axillary racemes; fruit blackish, 7–10 mm. in diameter, gland-dotted, sweet.—Common in thickets and pastures; rather widely distributed in tropical America, especially in the West Indies. Called "escobo" in Salvador, and "white stopper" in Florida.

Eugenia capuli (Schlecht. & Cham.) Berg. A densely branched shrub 1–3 meters high with slender branches; leaves short-petioled, lanceolate or oblong-lanceolate, usually 3–7 cm. long, long-acuminate, glabrous; flowers small, white, in dense clusters or in short racemes in the leaf axils; fruits globose, 3–4 mm. in diameter, at first red but turning black when ripe.—Common in wet forest, thickets, and wooded swamps; also in Salvador, Guatemala, and Mexico. Called "guacoquito" in Salvador. The fruits are edible.

Eugenia guatemalensis Donn. Smith. A shrub or small tree; leaves short-petioled, usually elliptic and 4–8 cm. long, shortly acuminate, acute at the base, silky-pubescent when young but in age sometimes nearly glabrous; flowers white, in short racemes or in clusters in the leaf axils; fruit oval, 8–12 mm. long, black at maturity, one-seeded.—In a wooded swamp near the coast; ranging from Salvador to Mexico; occurring also in the interior of Honduras. Called "guacuco" in Salvador.

Eugenia Jambos L. *Manzana. Rose-apple.* A fine tree, often 15 meters high, with a dense broad crown of dark green foliage; leaves narrowly lanceolate, long-acuminate, glabrous; flowers borne in terminal corymbs, greenish white, large and broad, the very numerous stamens long, white, and conspicuous; fruit globose, 3–4 cm. in diameter, whitish or yellowish, with thin crisp hard flesh and a large central cavity containing several seeds.—Planted frequently, and growing half wild in some localities; native of southeastern Asia, but planted commonly in tropical America, and naturalized in many regions. Usually called "manzana rosa" or "pomarosa" in Central America. The tree is an excellent one for shade because of its beauty and its ample crown. The fruit, which has a flavor somewhat suggestive of rose water, is eaten commonly in Central America, but chiefly by children, for it is little esteemed. It is only infrequently that it is exposed for sale in the markets.

Eugenia lancetillae Standl. A shrub or tree as much as 6 meters high; leaves large, short-petioled, elliptic-oblong, mostly 18–20 cm. long, acuminate, acute at the base, minutely pubescent beneath; flowers clustered in the leaf axils and along the older naked branches, sessile or nearly so; fruit globose, pale yellowish green, 12 mm. long, with very scant flesh.—In wet forest near Lancetilla; known only from this region.

Eugenia uniflora L. *Surinam cherry.* A dense shrub, the leaves nearly sessile, ovate, mostly 2.5–4 cm. long, blunt-acuminate, glabrous or nearly so; flowers on long slender pedicels, clustered in the

axils of the leaves, the petals white; fruit depressed-globose, 2.5 cm. in diameter, containing a large ridged stone.—Planted at Lancetilla and elsewhere; native of South America. The fruit of the Surinam cherry is very good to eat, being juicy and sweet and having an aromatic flavor that is altogether agreeable. It is particularly good for flavoring ice cream and other similar articles. The shrub also makes a handsome hedge plant because of its compact growth and glossy, deep green foliage.

MYRCIA DC.

Myrcia Oerstediana Berg. A shrub or tree 3–7.5 meters high with slender hairy branches; leaves very shortly petioled, oblong or lance-oblong, long-acuminate, obtuse at the base, appressed-hairy, especially beneath, conspicuously veined; flowers small, white, in lax, axillary and terminal panicles; fruit globose, 6–8 mm. in diameter, purple-red, minutely appressed-pubescent.—In wet forest and thickets on the hills and in the lowlands near the coast, uncommon; ranging to southern Mexico and Costa Rica. Called "turro" in Costa Rica. The fruit has an acid spicy flavor and is rather good to eat.

PIMENTA Lindl.

Pimenta officinalis Lindl. *Pimienta gorda. Allspice.* A tree 4.5–9 meters high with smooth, pale brown bark and dense crown; leaves petioled, oblong to oval-oblong, 9–20 cm. long, obtuse, glabrous or nearly so; flowers small, white, silky-pubescent, in small, chiefly axillary cymes; fruit 1–2-seeded, globose, 4–8 mm. in diameter. —Naturalized in thickets near the beach in the vicinity of Tela; native of southern Mexico but grown widely in the tropics. It is this tree which furnishes the allspice of commerce, that spice being the dried unripe berries. All parts of the tree have a delightful fragrance when crushed, and the odor is apparent also in a grove of the trees. The odor is retained for many years in herbarium specimens, a remarkable fact, since most aromatic plants lose their fragrance when dried for the herbarium.

PSIDIUM L.

The genus is composed of the guavas, shrubs or small trees with rather large, white or whitish flowers. The calyx usually is closed in bud, but as the flower develops it splits irregularly into 4 or 5 lobes, or sometimes it separates as a cap but remains attached to the calyx tube at one point. The fruits are large and edible, and commonly 4–5-celled.

Psidium Friedrichsthalianum (Berg) Niedenzu. *Guayaba agria.* A shrub or tree 3–6 meters high, the slender brownish branchlets having thin sharp winglike angles; leaves oblong or elliptic-oblong, acuminate, glabrous, short-petioled, the lateral nerves not conspicuous; flowers pure white, 3 cm. broad; fruit oval or globose, 4 cm. in diameter.—Frequent in swampy woods near the coast and also occurring farther inland; ranging to Panama and southern Mexico. Called "cas" in Costa Rica, and "arrayán" in Salvador. The fruit is acid and much more agreeable in flavor than that of the common guava.

Psidium Guajava L. *Guayaba. Guava.* A shrub or tree, rarely over 6 meters high; leaves short-petioled, 5–15 cm. long, acute or obtuse, with usually 12 or more pairs of stout riblike lateral veins, densely appressed-pubescent beneath; petals white, 1.5–2 cm. long.—Frequent in thickets along the beaches, also planted; widely distributed, both wild and cultivated, in tropical America. The sweet fruit, with its peculiar penetrating fragrance, is much eaten in Central America, and it is employed for making the familiar guava paste or jelly, one of the favorite desserts of the region. The wood is brownish or reddish gray, hard, strong, elastic, close-grained, and durable, but it is seldom used except sometimes for firewood.

MELASTOMACEAE. Melastome Family

This is one of the largest and most characteristic families of tropical American plants, consisting of shrubs and trees or rarely herbs, which often form an important part of the vegetation. The plants (except the genus *Mouriria*) are easy to recognize by their leaves, which are opposite and simple, and have 3 to 9 longitudinal nerves which arise at or near the base of the blade and run to the apex. The leaves are either entire or toothed, and their pubescence often consists of stellate hairs. The small or large and often showy flowers have white, pink, yellow, or purple petals, twice as many stamens as petals, and a simple style. The calyx is united with the ovary and fruit. The fruit is a 2- to many-celled capsule or a berry, and in the latter case it is usually edible.

ADELOBOTRYS DC.

Adelobotrys adscendens (Sw.) DC. An epiphytic shrub about 1 meter long, sometimes subscandent, nearly glabrous; leaves petioled, broadly ovate to elliptic, 7–15 cm. long, 5-nerved, acute, rounded at the base, entire and glabrous or nearly so; flowers in terminal panicles,

the petals white (yellow when dried), 8 mm. long; fruit an oblong capsule.—Occasional on trees in wet forest; ranging from Mexico to South America. The plant is not very common in Central America.

ARTHROSTEMMA R. & P.

Arthrostemma fragile Lindl. *Caña de Cristo.* A slender, very brittle, much-branched herb 1–2.5 meters long, clambering over bushes, the stems succulent, glabrous or sparingly hairy; leaves slender-stalked, ovate or ovate-oblong, acuminate, 5-nerved, 3–6.5 cm. long, nearly glabrous; flowers in few-flowered cymes, long-pediceled, the petals pink, 2–2.5 cm. long; fruit a cylindrical capsule 1 cm. long or larger.—Occasional in wet thickets; frequent in Central America, Mexico, and Cuba. A rather handsome and graceful plant, but the petals drop soon after the flowers open. Called "jazmín montés" in Salvador.

CLIDEMIA Don

The Clidemias are slender, usually very hairy shrubs with mostly ovate, 5–7-nerved leaves which are either entire or toothed. The small and inconspicuous flowers are arranged in axillary panicles. The calyx has 4–6 narrow outer lobes and often a series of very small inner ones. The fruit is a small juicy berry.

Clidemia brachystephana Triana. A shrub 1–2.5 meters high, the slender branches hirsute; leaves short-petioled, with 5 nerves, ovate-oblong, long-acuminate, obtuse or rounded at the base, nearly entire, short-hirsute, especially beneath; flowers in small panicles which are scarcely longer than the petioles, the petals white.—Occasional in wet forest or thickets; ranging from Guatemala to Colombia. This, like the other species, is a shrub of unattractive appearance.

Clidemia dentata Don. A dense shrub 1–2 meters high, the slender branches hirsute with bristling hairs; leaves slender-petioled, oblong to ovate, 5-nerved, long-acuminate, finely and closely toothed, rounded at the base, hirsute; cymes few-flowered, scarcely if at all longer than the petioles, the petals white or pink, 6 mm. long; berries 6–7 mm. long, bright red, hairy.—In wet thickets or wooded swamps; ranging to southern Mexico and Peru.

Clidemia Naudiniana Cogn. *Sirín.* A shrub 1–3.5 meters high, the branches densely covered with soft spreading tawny hairs; leaves ovate or ovate-oblong, 8–15 cm. long, long-acuminate, 5-nerved, obtuse at the base, densely and softly hairy, conspicuously

toothed; cymes few-flowered but lax and much longer than the petioles; petals white, 5 mm. long; fruit purple-black at maturity.—Frequent in wet forest and thickets; ranging to southern Mexico.

CONOSTEGIA Don

Conostegia pentaneura Standl. A shrub 2 meters high; leaves elliptic or oblong-elliptic, 15–25 cm. long, 5-nerved at the base, sparsely puberulent beneath on the nerves, otherwise glabrous; calyx in bud 6–7 mm. long, acute, glabrous.—Known only from the type, collected in forest near Lancetilla by F. M. Salvoza.

Conostegia xalapensis (Bonpl.) Don. *Uva. Plate LIV.* A shrub or tree 3–9 meters high with dense rounded crown; leaves petioled, oblong to ovate, 7–15 cm. long, acuminate, rounded to acute at the base, 5-nerved, finely toothed, green and nearly or quite glabrous above, covered beneath with a dense tomentum of whitish or brownish, branched hairs; flowers in dense terminal panicles, the petals pink, 3 mm. long; calyx closed in bud, the upper part falling off like a lid as the flowers open; fruit a small, dark purple berry.—Frequent in wet thickets, also in the mountains of the interior; one of the common plants of Central America; distributed from Colombia to Mexico. Called "sirín" in the interior, and the name "capiroto" is reported from Honduras. Called "canillito" and "quieravangué" in Panama; "lengua de vaca," "purré" and "escobillo" in Costa Rica. The fruits are sweet and of agreeable flavor, in their general appearance and flavor reminding one somewhat of huckleberries (*Gaylussacia*). They are sometimes sold in Central American markets.

HENRIETTELLA Naud.

Henriettella densiflora Standl. *Sirín.* A slender shrub 2.5–3 meters high, the branches covered with short close scurfy brownish pubescence; leaves nearly sessile, lance-oblong to elliptic-oblong, 9–20 cm. long, acuminate, acute at the base, 5-nerved, scurfy-pubescent beneath, especially along the nerves; flowers very small, sessile in small clusters in the leaf axils and on the naked branches below the leaves; fruit a small scurfy berry.—Frequent in wet forest; extending to Panama.

HETEROTRICHUM DC.

Heterotrichum octonum (H. & B.) DC. A shrub about 2 meters high, the slender branches covered with very long and spreading, brownish hairs; leaves petioled, broadly ovate, 7–9-nerved, acute

or acuminate, cordate at the base, densely and softly pubescent beneath with branched hairs, entire or nearly so, hirsute on the upper surface; flowers in small, mostly terminal panicles, the small petals white; fruit a purplish black berry, covered with long gland-tipped hairs.—Occasional in thickets; also in the interior, and widely distributed in tropical America. Called "peluda" and "hoja peluda" in Salvador.

LEANDRA Raddi

Leandra dichotoma (Don) Cogn. A shrub 2 meters high, the branches densely covered with slender spreading brownish hairs; leaves petioled, broadly ovate or elliptic, usually 7-nerved, long-acuminate, inconspicuously serrate, densely and softly pubescent, rounded at the base; flowers small, in large terminal panicles, the petals acute; fruit a small berry.—In wet thickets; distributed from Guatemala to South America.

MAIETA Aubl.

Maieta setosa (Triana) Cogn. A shrub about 1 meter high, the few branches densely covered with very long, stiff, recurved, brownish bristles; leaves short-petioled, the petiole bearing at the apex a large inflated 2-lobed bladderlike appendage, the blades broadly elliptic, 10–25 cm. long, abruptly short-pointed, 7–9-nerved, rounded or shallowly cordate at the base, long-hairy; flowers small, in stalked axillary cymes, the petals pink, 3 mm. long; fruit a berry about 3 mm. in diameter.—Noted here only in deep forest on the tops of the highest hills; distributed from southern Mexico through most of the lowlands of Central America. The plant is easy to recognize by the bladderlike appendages of the leaves.

MICONIA R. & P.

This, the largest genus of the family, is well represented almost everywhere in Central America. The plants are shrubs or trees with small or large, entire or toothed leaves. The 4–9-parted flowers, arranged in terminal panicles, usually have white petals. The fruit is a small edible berry, commonly blue, purple, or black.

Miconia angustispica Blake. *Sirín.* A shrub 2–3 meters high, the branches finely brownish-scurfy; leaves short-petioled, oblong to obovate, large, 3-nerved, long-acuminate, acute at the base, with fine brownish scurfy pubescence beneath, glabrous above; flowers in long slender spikelike panicles; fruits small, at first red but black at

maturity.—Common in wet forest; distributed from Guatemala to Panama.

Miconia argentea (Sw.) DC. *Cenizo.* A tree about 6 meters high, with a trunk 15 cm. in diameter, the crown dense and rounded; leaves long-petioled, elliptic to almost rounded, large, finely toothed, obtuse or acute, obtuse to rounded at the base, green and often shining on the upper surface, beneath covered with a very dense and fine white tomentum, 5-nerved; flowers small, white, in large dense panicles.—About Tela, but scarce; widely distributed in tropical America, and abundant in many parts of the Central American lowlands. Called "sirín" and "sirinón" in some parts of Honduras; in Panama "dos caras," "canillo," "oreja de mula," "cainillo," "papelillo," and "mancha-mancha"; in Costa Rica "María," "Santa María," and "capilote"; in Nicaragua "capirote blanco." The wood is brown, hard and heavy, rather fine-textured, and not durable. The tree is a very conspicuous one wherever it grows. When the branches are stirred by the wind, the white lower surfaces of the leaves are exposed, and the trees then appear to be covered with masses of white flowers.

Miconia Donnell-Smithii Cogn. A densely branched shrub or tree 3–4.5 meters high; leaves oblong or narrowly oblong, long-acuminate, acute at the base, the 2 lateral nerves arising above the base of the blade, nearly glabrous; branches of the panicle dark red; fruit black, juicy.—Frequent in swamps toward the Ulua River, but not found near Tela; also in Guatemala.

Miconia hondurensis Donn. Smith. A shrub or tree 2–6 meters high; leaves large, oblong or elliptic-oblong, acuminate, acute or obtuse at the base, the 2 lateral nerves arising above the base of the blade, glabrous, pale green beneath; flowers in large terminal panicles, sessile or short-pediceled, the petals pure white.—Frequent in thickets, forest, and swamps; the type was collected at Tela (Puerto Sierra) by Percy Wilson; distributed from Nicaragua to British Honduras.

Miconia hyperprasina Naud. A slender shrub or tree 3–5.5 meters high; leaves on short slender petioles, the blades oblong or elliptic-oblong, thin, bright green, acuminate, acute at the base, the 3 nerves arising at the very base of the blade, glabrous, nearly entire; flowers slender-pediceled, in small lax panicles.—In forest near the tops of the hills; widely dispersed in Central America and southern Mexico.

Miconia impetiolaris (Sw.) Don. *Plate LV.* A shrub about 3 meters high, the branches densely covered with brown scurfy pubescence; leaves very large, sessile, oblong-obovate, acute or short-acuminate, cordate at the base, glabrous above, covered beneath with fine brownish branched hairs; flowers small, white, in large panicles.—Frequent in forest and thickets; widely distributed in tropical America. Easily distinguished by the large sessile leaves. Called "dos caras" and "oreja de mula" (mule-ears) in Panama, and "hoja de pasmo" in Costa Rica.

Miconia oinochrophylla Donn. Smith. A shrub 2–3 meters high, glabrous throughout; leaves slender-petioled, lance-oblong, acuminate, acute or obtuse at the base, 3-nerved, green above, bright purple-red beneath; panicle branched, purple-red.—In a wooded swamp near Triunfo; also in Guatemala. The shrub is an exceptionally handsome and showy one because of the brightly colored lower surfaces of the leaves. It well deserves introduction into cultivation in the tropics.

Miconia Schlimii Triana. *Sirín, Sirín blanco.* A shrub or tree 3–7.5 meters high, the branches with dense brownish scurfy pubescence; leaves short-petioled, usually lanceolate, long-acuminate, acute at the base, the 4 lateral nerves arising far above the base of the blade, conspicuously toothed, pubescent beneath, at least along the nerves, with brownish branched hairs; panicles small and few-flowered; petals white; berries large, about 7 mm. broad.—Common in thickets and forest; dispersed from Guatemala to Colombia. The fruit, as in other species, is edible.

MOURIRIA Aubl.

Mouriria parvifolia Aubl. A slender shrub or tree 3–6 meters high, glabrous; leaves sessile, ovate-oblong, 5–7 cm. long, acuminate, rounded at the base, entire, pinnately nerved; flowers small, axillary; fruit a small berry.—Occasional in wet forests and wooded swamps; ranging from Mexico to Panama. Called "arracheche" in Panama, and "camarón" and "capulín verde" in Salvador. Known in British Honduras by the names "cacho de venado" and "half crown." In the form of its leaves, this plant bears little resemblance to other members of the family listed here.

OSSAEA DC.

The species are inconspicuous shrubs with thin leaves which often are abruptly decurrent at the base. The small flowers are axillary,

panicled, with white or pink, acute petals. The fruit is a small berry which frequently is sharply ribbed.

Ossaea ciliata (Griseb.) Cogn. A slender glabrous shrub 1.5 meters high; leaves slender-petioled, oblong-elliptic, 8–10 cm. long, acuminate, acute at the base, 3-nerved, entire or nearly so, thin; flowers in small panicles, sessile at the ends of the branches; berry white, 8–10-ribbed, 4–5 mm. long.—In wet forest; ranging from Guatemala to Panama and Trinidad. The berries have the flavor of black pepper.

Ossaea micrantha (Sw.) Macfad. A slender shrub 1.5–3 meters high, the branches finely stellate-pubescent; leaves short-petioled, oblong, thin, acuminate, acute at the base, sparsely and minutely stellate-pubescent beneath, with 4 lateral nerves, 2 of them arising well above the base of the blade; flowers small, slender-pediceled, in small lax panicles; fruits white when fresh, very juicy, when dry, scarcely 3 mm. in diameter, sharply ribbed.—Common in wet forest; widely distributed in tropical America.

Ossaea trichocalyx Pittier. A slender shrub 1–2 meters high, the green stems often reclining, minutely brownish-puberulent or nearly glabrous; leaves slender-petioled, ovate, acuminate, at the base abruptly contracted and decurrent, with 6 lateral nerves which rise well above the base of the blade, entire, nearly glabrous beneath; flowers densely clustered in the leaf axils or on naked branches below the leaves; berries rose-red, red, or violet.—In wet mountain forest; also in Panama.

TOCOCA Aubl.

Tococa grandifolia Standl. A shrub 2–3.5 meters high, the stout branches densely covered with very long and thick bristles; leaves short-petioled, broadly elliptic, about 30 cm. long and 20 cm. wide, abruptly short-pointed, rounded at the base, 5-nerved, bristly beneath along the nerves; flowers in small dense terminal panicles, the small petals pale pink; fruit a small purple-red berry.—Frequent in wet forest; known only from this region.

ONAGRACEAE. Evening-primrose Family

JUSSIAEA L.

The Jussiaeas are small or large herbaceous plants with alternate entire leaves, without stipules. The showy yellow flowers are axillary, with a long narrow inferior ovary, 4–6 green sepals, and as

many petals which fall soon after the flower opens. The fruit is a 4–6-celled capsule, containing numerous small seeds.

Jussiaea affinis DC. An erect bushy-branched herb a meter high or less, densely pubescent throughout with short curled hairs; leaves ovate or elliptic; sepals 5; capsule terete, long and slender.—Frequent in swamps or marshes, in wet thickets, or along ditches; widely distributed in tropical America.

Jussiaea decurrens (Walt.) DC. Plants slender, erect, annual, the stems conspicuously winged, the whole plant glabrous or nearly so; leaves lanceolate or linear-lanceolate; capsule short, 4-angled.—On open banks or in open wet soil, sometimes a weed in cultivated ground, widely distributed in tropical America.

Jussiaea erecta L. Plants erect, branched, nearly glabrous, slender, the stems not winged; leaves lanceolate; capsule short, 4-angled and narrowly 4-winged.—A weed in garden at Lancetilla; perhaps introduced; widely distributed in tropical America.

Jussiaea leptocarpa Nutt. Plants often a meter high, pubescent with spreading hairs; leaves lanceolate; sepals 5; capsule long and slender, terete.—In wet thickets; widely dispersed in tropical America.

Jussiaea natans HBK. *Lechuga, Berro.* Plants long and slender, floating on the surface of water; leaves orbicular, on long slender petioles.—In streams and pools; widely distributed in tropical America. The plant often forms large masses over the surface of ponds and swamps.

Jussiaea repens L. Stems thick and fleshy; leaves long-petioled, spatulate or obovate-oblong, obtuse or rounded at the tip; capsule short, long-stalked, terete.—Growing in shallow water near Tela; generally distributed in tropical America.

Jussiaea suffruticosa L. A slender branched herb, often a meter high or more, glabrous or somewhat pubescent; leaves lanceolate or linear-lanceolate; capsules long and slender, terete.—Common in wet fields and thickets, often a weed in cultivated ground; generally dispersed in tropical America; one of the most abundant weeds of Central America. The species is easy to recognize by its seeds, which are quite different from those of the other species. They have a much enlarged raphe which resembles a sterile cell attached to the seed. In Salvador this plant is called "hierba de santa cruz," "sulfatillo," and "sanangujo."

ARALIACEAE. Ginseng Family

GILIBERTIA R. & P.

Gilibertia Smithiana I. M. Johnston. A glabrous shrub or tree 3–9 meters high with dense spreading crown; leaves alternate, long-stalked, oblong to elliptic, 9–17 cm. long, entire, acute or short-acuminate, obtuse or rounded at the base; flowers small, greenish, in small umbels, the umbels arranged in short racemes; petals 5, distinct; stamens 5; fruit a small, dark red or black berry containing about 5 small 1-seeded nutlets.—Occasional in wet thickets and forest; ranging from Guatemala to Panama.

NOTHOPANAX Miq.

Nothopanax Guilfoylei (Cogn. & Marché) Merrill. A dense shrub, the leaves pinnate, the 5–7 leaflets commonly margined or blotched with white.—Planted for ornament; native of Polynesia or the East Indies. It is probable that *N. fruticosum* (L.) Miq., with twice-pinnate leaves, and *N. ornatum* (Bull.) Merrill, with 11–17 green leaflets, also are in cultivation. The shrubs of this genus are favorite ornamental plants throughout Central America, especially for hedges.

UMBELLIFERAE. Carrot Family

APIUM L.

Apium Petroselinum L. *Perejil. Parsley.* Planted occasionally in gardens.

DAUCUS L.

Daucus Carota L. *Zanahorria. Carrot.* This vegetable is planted commonly in gardens throughout the region.

ERYNGIUM L.

Eryngium foetidum L. *Culantro.* A low glabrous perennial herb, having a basal rosette of coarsely and sharply toothed, oblanceolate, obtuse leaves, the stem leaves few-toothed or 3-lobed; flowers small, greenish, in dense heads surrounded by leaflike bracts; fruit dry.—In thickets and pastures, but apparently very scarce about Tela; common in many parts of Central America, and widely distributed in tropical America. Called "culantro coyote" in Panama, and "acapate" in Salvador. Known as "spirit-weed" and "fit-weed" among the West Indians living in the Canal Zone. All parts of the plant, but especially the root, have a strong and very offensive odor.

Nevertheless, the leaves are much used everywhere in Central America for flavoring soups and stews, to which they impart an altogether agreeable flavor.

MYRSINACEAE. Myrsine Family

This group is an exclusively tropical one, composed of shrubs or small trees having alternate, entire or toothed leaves without stipules. All parts of the plant may be marked with dark or pale glands or lines. The flowers are small, white or pink, 4–5-parted, with an inferior calyx. The petals are more or less united and spreading, the 4–5 stamens being inserted opposite the petals and attached to them. The fruit is a small globose berry or drupe, commonly black or dark purple when ripe, and edible.

ARDISIA Sw.

The Ardisias, of which there are numerous species in Central America, especially in the mountains, are shrubs or small trees, usually glabrous or nearly so, with small, white or pinkish flowers arranged in terminal panicles, the corolla being glabrous. The globular fruits are 1-seeded.

Ardisia amplifolia Standl. *Uva de monte, Uva de montaña.* A glabrous shrub or small tree 2.5–4.5 meters high; leaves thick, obovate, 15–25 cm. long, rounded to acutish at the apex, long-tapering to the base; flowers arranged in umbels, the umbels forming small panicles, the rachis and pedicels bright cherry-red; fruit 8 mm. in diameter or larger, bright red at first but black at maturity.—Occasional in wet thickets and forest about Lancetilla and Tela; also in Nicaragua. The fruit is edible. The shrub is a very handsome and showy one in either flower or fruit, and is well worthy of cultivation.

Ardisia compressa HBK. A glabrous tree 4.5–9 meters high; leaves short-stalked, oblong-elliptic, mostly 10–17 cm. long, acute or acuminate, entire; flowers white, 3–4 mm. long, in small panicled umbels; sepals and petals with conspicuous dots and lines; fruits 5 mm. in diameter, red, turning black, edible; rachis of the inflorescence bright red.—Occasional in the hill forest; ranging to Mexico and South America. Called "camaca" at Siguatepeque, and the name "cucuyul" is reported from Honduras. Called "tucuico" and "murta" in Costa Rica; "cerezo," "cerecilla," and "cotomate" in Salvador. The wood is reddish brown, hard, heavy, and medium-

textured. The fruit is edible, but the stones are so large that there is little pulp to be eaten.

Ardisia Mitchellae Johnston. A slender shrub or small tree 2.5–6 meters high, glabrous; leaves short-stalked, oblong-elliptic, mostly 8–12 cm. long, acuminate, with numerous low broad teeth; flowers pink, 6–7 mm. long, in few-flowered umbels, the umbels clustered at the tips of the branches or in short racemes; fruit bright red, nearly 1 cm. in diameter when fully developed.—Frequent in wet thickets and forest; known only from this region.

Ardisia nigropunctata Oerst. A shrub 2.5–3 meters high with few branches, nearly glabrous; leaves short-stalked, obovate-oblong, usually 20–30 cm. long or larger, acute or acuminate, tapering to the base, entire, conspicuously black-dotted beneath; flowers in small umbels, the umbels arranged in large panicles, the branches rusty-scurfy; young fruits greenish white, with numerous large, dark red dots.—Noted only in a wet thicket on Farm 39 near Guaymas; ranging to Costa Rica.

Ardisia pellucida Oerst. A shrub 1.5–2.5 meters high, simple or with a few branches; leaves very large, borne at the ends of the branches, oblong-obovate, usually 45–55 cm. long and 15–19 cm. wide, acuminate, long-tapering to the base, somewhat rusty-scurfy beneath and gland-dotted, the margin very densely serrate with slender, very narrow, spreading teeth; flowers in umbels or short racemes arranged in dense corymbs; fruit 5–6 mm. in diameter, dull pale purplish.—Frequent in wet mountain forest; extending to southern Mexico.

PARATHESIS Hook. f.

Parathesis serrulata (Sw.) Mez. *Cuya.* A shrub or tree 3–9 meters high or larger, the stout branches rusty-tomentose; leaves short-stalked, oblong or lance-oblong, usually 10–25 cm. long, acuminate, entire or nearly so, somewhat rusty-tomentose beneath or nearly glabrous; flowers white or pink, 4 mm. long, in narrow terminal panicles, the corolla rusty-tomentose outside; fruit globose, purple-black.—In wet forest on the hills about Lancetilla, rather scarce; widely distributed in tropical America. The name "cugía" is reported from Nicaragua.

SAPOTACEAE. Sapodilla Family

The family is composed of trees which usually have a milky sap. The leaves are alternate, entire, petioled, without stipules, and

usually persistent upon the tree. The small perfect flowers are borne in the leaf axils or on the older naked branchlets. They are white or greenish and have 4–12 overlapping sepals and a corolla of united lobes which often bears appendages between the lobes. The fruit is a large berry or drupe containing one to several large seeds.

To this family belongs the sapodilla, *Achras Zapota* L., called "níspero" in most parts of Central America. From its latex is obtained the chicle gum of which chewing gum is made. The sapodilla has its center of distribution in the Yucatan Peninsula. I did not observe it in cultivation in the Tela region, except for a few small plants at Lancetilla, but it is probable that it is planted about Progreso.

CALOCARPUM Pierre

The Central American species of *Calocarpum* are tall trees with large, thin, short-petioled, deciduous leaves. The small flowers are borne on the older, usually naked branches. The ovary is 4–5-celled, and the fruit is usually large and edible.

Calocarpum mammosum (L.) Pierre. *Zapote. Sapote.* A very large or medium-sized tree with milky sap; leaves oblanceolate or obovate, 15–30 cm. long, obtuse or acutish, long-tapering to the base, sparsely pubescent beneath or nearly glabrous, the smaller veins not elevated nor very conspicuous; flowers sessile or nearly so; fruit globose or ovoid, 8–20 cm. long, with rough brown skin and pink or reddish flesh in which is embedded a single large brown polished seed. —Common in the forests and also planted; native of Mexico and Central America, but now grown in most tropical regions. This is one of the favorite fruits of the Central American people. The flesh of the fruit is of good flavor, although it is sweet and rather insipid, as is the case with so many of the tropical fruits. The wood is light reddish, hard and heavy, and medium-textured. It is little used because the trees are protected for their fruit. Sapote trees are plentiful in the primeval forest of the high hills above Lancetilla.

Calocarpum viride Pittier. *Zapotillo.* A large tree with milky sap; leaves obovate or oblanceolate, narrowly long-acuminate, hairy beneath along the veins, the smaller veins elevated and closely reticulated, very conspicuous; fruit much like that of the sapote but smaller.—Common in the hillside forests; extending to Costa Rica and Guatemala. Called "ingerto" and "zapote ingerto" in Salvador and Guatemala. I was told that the fruits were not eaten in Honduras.

CHRYSOPHYLLUM L.

The trees of this genus are easily recognized by their leaves, which are oblong to oval, glabrous on the upper surface, and densely covered beneath with closely appressed, brownish, glistening hairs. The very small flowers are clustered in the leaf axils or on naked branches.

Chrysophyllum Cainito L. *Caimito. Star-apple.* A medium-sized tree with very dense, broad crown; leaves 7–15 cm. long, abruptly short-pointed, covered beneath with golden-brown hairs; flowers 4 mm. long, the corolla silky-hairy; fruit resembling a small apple, with smooth, green or purple skin, containing several compressed brown seeds.—Planted occasionally for its fruit; probably native in the West Indies, but planted generally in tropical America. The fruit is highly esteemed by some persons. Its flesh is sweet and rather sticky, with milky juice. When cut transversely the seeds are seen radiating like the points of a star, hence the English name. The star-apple makes one of the handsomest shade trees of Central America because of its very dense and attractively colored crown. When the branches are stirred by the wind the effect is very beautiful, the golden under surfaces of the leaves being exposed in successive waves of color. The wood is pinkish or reddish brown, moderately hard and heavy, but it is little used because not available in quantity.

Chrysophyllum mexicanum Brandeg. *Caimito.* A tree usually 5–12 meters high with dense spreading crown; leaves rounded to short-pointed at the apex, pale brown beneath; flowers 2 mm. long, the corolla glabrous; fruit 1-seeded, oblong or ellipsoid, about 1.5 cm. long.—Occasional in thickets about Tela and Progreso; extending to Salvador and southern Mexico. Sometimes called "zapotillo" in Salvador, and "wild star-apple" in British Honduras. The fruits are edible but of little value for food because of their small size.

LABATIA Mart.

Labatia Standleyana Pittier? *Zapotillo.* A large forest tree; leaves large, oblanceolate or obovate-oblong, acute or acuminate, densely covered beneath with whitish silky hairs.—Common in wet forest on the hills about Lancetilla; the species occurs in Panama. Only sterile specimens were obtained, consequently the proper position of this common tree is uncertain. The leaves resemble those of *Labatia Standleyana* in shape and pubescence, but they are larger than those of Panama specimens.

LUCUMA Molina

The Lucumas are usually large trees with milky sap and large or small, glabrous leaves. The small greenish axillary flowers are pubescent and have 4–6 sepals and a 4–5-celled ovary.

Lucuma campechiana HBK.? A small tree with large, oblanceolate-oblong, short-pointed, bright green, glabrous leaves which are slender-petioled.—Sterile material, doubtfully referable here, was collected in thickets near Progreso; the species occurs in the Yucatan Peninsula.

Lucuma izabalensis Standl. *Silión.* A very large tree with tall trunk and broad thin buttresses; leaves petioled, leathery, oblong, abruptly slender-acuminate, acute and decurrent at the base, glabrous, pale when dry.—Common in wet forest on the hills above Lancetilla; occurring also in Guatemala. This species is still imperfectly known because of the lack of adequate material. Its wood is employed in Guatemala for railroad ties.

LOGANIACEAE. Logania Family

The plants listed below are herbs or climbing shrubs with opposite or whorled, entire leaves with or without stipules. The regular perfect flowers have a 4–5-lobed calyx and a corolla of 4 or 5 united petals. The stamens are of the same number as the corolla lobes and alternate with them, and inserted in the tube or throat of the corolla. The ovary is 2-celled, and the fruit is either a capsule or a berry.

POLYPREMUM L.

Polypremum procumbens L. A slender glabrous much-branched herb, the stems usually spreading or procumbent; leaves linear, opposite, without stipules, often with clusters of smaller leaves in their axils; flowers minute, solitary, sessile or nearly so, chiefly in the forks of the branches; calyx usually with 4 linear lobes; fruit a small, ovoid or globose capsule.—In sand along the beach near Tela; widely distributed in tropical America. The plant is an inconspicuous weed which seldom attracts notice. In Salvador it is called "comino montés" and "corredora."

SPIGELIA L.

The Spigelias are low, simple or branched, nearly glabrous, annual or perennial herbs. The leaves are opposite or whorled, lanceolate or ovate, acute or acuminate, and sessile or very shortly petioled.

The small whitish flowers, 5–10 mm. long, are arranged in one-sided spikes which are terminal or in the forks of the branches. The fruit is a small, 2-celled, slightly compressed capsule.

Spigelia Anthelmia L. An erect herb usually 30 cm. high or less, the stems terete in cross section, not angled; capsule covered with wartlike projections; corolla white with purple stripes.—Noted only in a grassy field near La Fragua; widely distributed in tropical America. In the British West Indies the plant is called "worm-grass." The roots have long been used in tropical America as a remedy for tapeworms and other intestinal parasites, but care must be employed in administering them, for too large doses are said to cause vomiting, convulsions, and death.

Spigelia Humboldtiana Cham. & Schlecht. A low herb, apparently perennial; stems more or less plainly 4-angled; capsules smooth.—Occasional in clearings, rarely found in hill forest; a weedy plant, widely distributed in tropical America. Called "lombricera" and "lombricilla" in Salvador, and used throughout Central America in the same manner as *S. Anthelmia.*

STRYCHNOS L.

Strychnos panamensis Seem. *Guaco.* A large woody vine, glabrous or nearly so, provided with coiling tendrils; leaves opposite, nearly sessile, lanceolate to ovate, 4–8 cm. long, acuminate, conspicuously 3-nerved; flowers white, about 2 cm. long, in terminal or axillary cymes, the corolla with a slender tube and 5 short lobes; fruit globose, 4–8 cm. in diameter, with a thick hard shell.—Common in wet thickets and forest; ranging to Salvador and Panama. Called "fruta de murciélago" and "canjura" in Panama, and "guacamico" in Salvador. The roots, which are fleshy and 2.5–5 cm. thick, are valued in Honduras as a sovereign remedy for internal pains of all sorts, and the plant is gathered frequently for use in domestic medicine. The roots are eaten raw when used medicinally. The Lancetilla specimens are all sterile, and the specific determination is therefore uncertain.

From *S. Nux-vomica* L., of India, are obtained nux-vomica and strychnine.

GENTIANACEAE. Gentian Family

LEIPHAIMOS Schlecht. & Cham.

Leiphaimos parasiticus Schlecht. & Cham. A low slender white glabrous saprophytic plant, without chlorophyll, 15 cm. high

or less; leaves represented by small scales; inflorescence bifid; corolla tubular, 5–6 mm. long, the limb with 5 short acute lobes; fruit a small capsule.—Found here only once, in dark wet forest under corozo palms; occasional in Central America and southern Mexico and in the West Indies. The plants of this genus simulate closely in habit and appearance, even to the form of their inflorescence, some of the Burmanniaceae, with which they can be confused easily in the field, even by a botanist.

APOCYNACEAE. Dogbane Family

These plants are usually shrubs, woody vines, or small trees, but sometimes herbs, with milky sap. The leaves are simple and entire, without stipules, and either opposite, whorled, or alternate. The perfect and regular flowers, commonly arranged in cymes, are frequently large and showy. They have a 5-lobed calyx frequently glandular within, a funnelform or salverform, 5-lobed corolla, the 5 stamens inserted on the tube or throat of the corolla and having short filaments and narrow, often connivent anthers. The fruit consists of 2 carpels or pods which are dry or fleshy and either dehiscent or indehiscent.

ALLAMANDA L.

Allamanda cathartica L. A large glabrous woody vine; leaves mostly in whorls of 3 or 4, oblong to obovate, 10–18 cm. long, acuminate, somewhat leathery; corolla bright yellow, trumpet-shaped, 7–9 cm. long; fruit rounded and compressed, 4–6 cm. broad, covered with long stout flexible spines.—In wooded swamps near the coast; ranging along the Atlantic coast of Central America and in South America. The vine is a strikingly handsome one because of its large, brightly colored flowers, and it is often planted for ornament in the southern United States and other regions, also in Central America. In the Canal Zone the Americans call the flowers "buttercups."

ASPIDOSPERMA Mart. & Zucc.

Aspidosperma megalocarpon Muell. Arg. *Chaperno.* A large tree; leaves opposite, oblong, 12–20 cm. long, short-petioled, short-acuminate, leathery, glabrous in age; flowers about 6 mm. long, in panicled cymes, the inflorescence tomentose; fruits dry, obovate, compressed, more or less oblique, 12–16 cm. long, contracted below into a stout stalk, densely tomentose; seeds compressed, the body 2–2.5 cm. wide, surrounded by a broad and very thin wing, the whole

seed 7–9 cm. in diameter.—In wet forest on the mountains above Lancetilla; apparently rare, for it was noticed in only one locality; ranging from southern Mexico to Panama. Called "chichique" and "chíchica" in Guatemala, and "volador" in Veracruz. Known in British Honduras as "My Lady."

Only one species of *Aspidosperma* is known from Central America, but the genus is represented in South America by many species, some of which furnish valuable wood.

Beaumontia grandiflora Wall. is planted for ornament at Lancetilla, and is seen rather frequently elsewhere in Central America. It is a large woody vine, native of India, with white flowers 20 cm. long, resembling those of the Daturas. It is a very showy and handsome plant when in full bloom. In Salvador it is called "pomoncio" and "azucena japonesa."

ECHITES Jacq.

Echites trifida Jacq. A large woody vine with slender stems; leaves slender-petioled, opposite, oblong to oval, obtuse, rounded at the base, glabrous; flowers about 3 cm. long, the corolla green and white, with a long slender tube and abruptly spreading limb; fruit of 2 long slender terete pods or follicles.—In wet thickets about Tela; widely distributed in tropical America.

Another species, *E. microcalyx* A. DC., with bright yellow flowers and densely pubescent leaves, grows in the mountains of the interior.

LOCHNERA Reichenb.

Lochnera rosea (L.) Reichenb. (Sometimes called *Vinca rosea.*) An inconspicuously pubescent, erect herb a meter high or less, branched; leaves opposite, petioled, oblong to obovate, obtuse, acute at the base; flowers solitary or in 2's in the leaf axils, the corolla white or pink and 3 cm. long; fruit of 2 slender pods 2–3 cm. long.—Occasional in thickets near the beaches, also frequent in cultivation; probably native of the Old World, but cultivated and often naturalized in tropical America and as far north as Florida. In the United States and the West Indies the plant usually is called "vinca," "periwinkle," and "old maid." In Panama it is called "jazmín" and "chavelita"; in Salvador "chula," and "mulata." The names "chuladita" and "clavellina" are reported from Honduras. The plant, which is a rather showy one because of its large flowers, is abundant in the cemetery at Tela, and it is found in most cemeteries

of Central America generally. It is reported that in some parts of Honduras an infusion of the plant is employed as a gargle for treating sore throat.

MALOUETIA A. DC.

Malouetia guatemalensis (Muell. Arg.) Standl. A glabrous tree 6–9 meters high; leaves opposite, short-stalked, elliptic or ovate, long-acuminate, acute at the base; flowers small, about 12 mm. long, white, clustered in the leaf axils.—In thickets along streams near Tela; ranging from Guatemala to Panama.

NERIUM L.

Nerium Oleander L. *Narciso. Oleander.* This ornamental shrub is seen occasionally in gardens, and it is a favorite throughout Central America.

ODONTADENIA Benth.

Odontadenia speciosa Benth. A large glabrous woody vine; leaves opposite, short-stalked, oblong to elliptic, 15–30 cm. long; flowers bright yellow, 5 cm. long, in large cymes.—In wet thickets; not found here in flower; ranging to Panama and South America. Called "negrillo" in Panama.

RAUWOLFIA L.

Rauwolfia canescens L. A low shrub; leaves mostly whorled, small, oblong-obovate, acute, densely pubescent beneath; flowers small, greenish white, in chiefly axillary cymes; fruit small, berry-like, juicy, at first red but at maturity purple-black.—Collected in pasture near Progreso; widely distributed in tropical America, but rare in Central America.

RHABDADENIA Muell. Arg.

Rhabdadenia paludosa (Vahl) Miers. A small glabrous woody vine; leaves opposite, slender-petioled, oval to narrowly oblong, fleshy, rounded at the apex, acute or obtuse at the base; flowers in few-flowered racemes, the corolla pale pink, 6–7 cm. long; fruit consisting of 2 long slender pods.—In swamps near the coast; widely distributed in tropical America in coastal thickets and mangrove swamps. The milky sap is reported to blister the skin, and to have purgative or even poisonous properties.

STEMMADENIA Benth.

Stemmadenia Donnell-Smithii (Rose) Woodson. *Cojón de mico, Cojón de burro. Plate LVI.* A shrub or tree 3–9 meters high with copious milky sap; leaves opposite, nearly sessile, obovate-oblong, cuspidate-acuminate, tapering to the base, nearly glabrous except beneath along the midrib; flowers in small cymes, the corolla buff, about 3.5 cm. long; fruit large, consisting of 2 rusty-brown fleshy follicles or pods 7 cm. long or larger.—Common in wet thickets; occurring also in Guatemala and Salvador. The tree is conspicuous because of the large fruits, which often are borne in great quantities. Called "cojón" and "cojón de puerco" in Salvador, where the sticky latex is employed for fastening cigarette wrappers. In that country various uses are made of the plant in domestic medicine. The latex contains a substance having the same properties as gutta-percha.

TABERNAEMONTANA L.

Tabernaemontana citrifolia L. *Cojón de mico.* A glabrous tree 4.5–7.5 meters high with copious milky sap, the crown dense and rounded; leaves opposite, short-stalked, oblong or obovate-oblong, obtuse or short-acuminate, tapering to the base; flowers small, about 1 cm. long, in large stalked cymes, the corolla cream-colored; fruit of 2 fleshy pods or follicles 3 cm. long or larger.—Common in thickets; widely distributed in tropical America. Called "cachito" in Nicaragua.

THEVETIA Adans.

Thevetia nitida (HBK.) A. DC. A glabrous shrub or tree 2–6 meters high with copious milky sap; leaves alternate, short-stalked, obovate to oblanceolate-oblong, abruptly short-pointed, tapering to the base, thick, dark green; flowers yellow, about 2.5 cm. long; fruit a thick fleshy drupe 3–6 cm. broad, bright red or purple at maturity, and containing 2 large seeds.—Frequent in wet thickets or forest; widely distributed in Central America. Known in Panama as "cojón de gato," "lavaperro," and "huevo de tigre." The plant is usually regarded as poisonous.

Thevetia peruviana (Pers.) Merrill. *Chilindrón.* A shrub or small tree with linear glabrous leaves; flowers large, bright yellow.—Planted for ornament in Tela and elsewhere; native of Mexico or Central America. Called "chilca" in the interior of Honduras; in

Panama "amancay" and "campanilla." The flowers are handsome and sweet-scented. The milky sap and the seeds are reputed to be poisonous.

ASCLEPIADACEAE. Milkweed Family

Plants erect or climbing, herbaceous or sometimes woody, the sap milky; leaves opposite and entire, without stipules; flowers perfect, chiefly in umbel-like or racemelike cymes; calyx inferior, with very short or no tube; corolla of united petals, broad and open, 5-lobed; a variously modified crown usually present and united with the corolla throat or with the stamen tube; stamens 5; fruit of 2 follicles, one of them sometimes abortive, the seeds generally with a tuft of silky hairs. The family is noteworthy for the extremely complicated structure of the flowers, which, however, always suggest more or less clearly those of our common milkweeds.

ASCLEPIAS L.

Asclepias curassavica L. *Viborana.* An erect herb a meter high or less; leaves lanceolate, petioled, glabrous or nearly so; flowers in umbels, yellow and dark red.—A frequent weed in thickets or open places; generally distributed in tropical America. The name "vinorama" is reported from Honduras. Other names given to the plant in Central America are: "pasorín," "niño muerto" (Panama); "sangrís," "señorita" (Salvador). The milky sap is administered to children in Honduras as a remedy for worms, but its use is considered dangerous, because the plant is reputed poisonous. This is the only common and widely distributed species of *Asclepias* occurring in tropical America.

FISCHERIA DC.

Fischeria funebris (Donn. Smith) Blake. A large herbaceous vine, densely brownish-hirsute throughout; leaves long-petioled, large, thin, broadly elliptic to rounded, cordate at the base; flowers in short racemes.—In wet thickets; occurring in Costa Rica. The plant was not found in flower about Lancetilla, and its specific determination is, therefore, very uncertain.

FUNASTRUM Fourn.

Funastrum clausum (Jacq.) Schlechter. A small herbaceous vine, nearly glabrous; leaves linear to oblong, slender-petioled, pale beneath; flowers whitish, 1 cm. broad, arranged in long-stalked

umbels; pods 5–6.5 cm. long, 1 cm. thick.—Frequent in wet thickets; widely distributed in tropical America. Called "mata-tórsalo" in Costa Rica, the leaves being applied as a poultice to kill the grubs of the insect called "tórsalo," which lays its eggs in the human body.

MARSDENIA R. Br.

Marsdenia macrophylla (H. & B.) Fourn. (?). A small woody vine, nearly glabrous; leaves thick, ovate to broadly oval or rounded, rounded and short-pointed at the apex, usually cordate at the base; flowers in many-flowered short-stalked cymes.—In wet thickets; ranging from Mexico to northern South America. The specimens from Lancetilla are sterile, and the specific determination consequently doubtful.

VINCETOXICUM Walt.

Vincetoxicum stenanthum Standl. *Cuchamper.* A large slender herbaceous vine; leaves long-petioled, oblong-cordate, long-acuminate, deeply cordate at the base, thin, glabrous or nearly so; flowers in small axillary umbel-like racemes; corolla green, with long, narrow, almost linear lobes.—In wet thickets; growing also in British Honduras. The young and tender pods are said to be used for making sweetmeats.

CONVOLVULACEAE. Morning-glory Family

The Central American plants of this family are mostly much like the morning-glories of the United States, being chiefly herbaceous vines with showy flowers. The leaves are alternate, simple or compound, without stipules, and the perfect flowers are axillary and solitary or arranged in cymes or panicles. The calyx, of 5 lobes or sepals, is normally persistent in fruit; the corolla of united petals usually has a 5-lobed or angled, or sometimes entire limb, and a long tube, the 5 stamens being attached in its throat. The fruit is 2–6-celled, and usually a capsule.

ANISEIA Choisy

Aniseia martinicensis (Jacq.) Choisy. A small or large, herbaceous vine, often climbing over trees, pubescent or almost glabrous; leaves petioled, oblong or lanceolate, obtuse or rounded at the tip and mucronate, often silky-pubescent, narrowed to the base; flowers small, white, in long-stalked axillary clusters, the broad corolla densely hairy outside; sepals dissimilar, the outer ones broader.—

Frequent in thickets; widely distributed in tropical America. Called "bejuco de pescado" in Salvador, the tough stems being used as lines for stringing fish.

CALONYCTION Choisy

Calonyction aculeatum (L.) House. *Pañal de niño. Moonflower.* A large herbaceous vine, the stems often furnished with recurved fleshy prickles; leaves broadly cordate, long-stalked, entire or lobed, glabrous; flowers solitary or in small cymes; sepals with long slender hornlike tips; corolla white, the very slender, greenish tube 8–12 cm. long.—Frequent in wet thickets; widely distributed in the tropics. Called in Salvador "galán de noche," "pitoreta," "garza," and "bejuco de tabaco." The milky sap is employed in some parts of Central America for coagulating rubber sap, and in Salvador the stems are used for stringing tobacco leaves when these are hung for drying. The corollas of the moonflower open rapidly in the evening, and close the following morning. The plant is often cultivated for ornament in northern regions.

IPOMOEA L. Morning-glory

The genus is a very large one, and it is well represented in Central America. In favorable localities, and at the proper season of the year, these plants afford brilliant displays of color, in this respect being surpassed, perhaps, by no other Central American plants. In the interior of Honduras, toward the Pacific coast, there occurs one of the tree morning-glories, with handsome large white flowers. It is typical of a group which ranges from northwestern Mexico to Salvador.

Ipomoea Batatas (L.) Lam. *Camote. Sweet-potato.* This creeping herbaceous vine, with more or less lobed leaves and white and purple flowers, is naturalized frequently in this region, and, of course, it is cultivated abundantly, as it is almost throughout Central America, where it is a favorite vegetable. It is not known definitely whether the sweet-potato is a native of tropical America or of the Pacific islands, but it is probably American. At Triunfo sweet-potatoes are grown in the sand close to the seashore, each plant on a separate, good-sized hillock of sand.

Ipomoea callida House. Stems puberulent; leaves ovate, sagittate-cordate, acuminate, entire, the petioles very short; peduncles usually longer than the leaves; outer sepals acute, the inner ones

obtuse; corolla 2 cm. long, the limb blue.—The species is known only from the original collection, obtained on the Yoro Road near Tela by Percy Wilson (No. 534).

Ipomoea cathartica Poir. A large herbaceous vine, inconspicuously pubescent; leaves broadly cordate, entire or lobed; sepals ovate, glabrous, green, acute or acuminate; corolla deep blue, 7–9 cm. long.—Frequent in thickets; widely distributed in tropical America. This is one of the handsomest of the Central American species.

Ipomoea Mitchellae Standl. *Campanilla.* A slender, nearly glabrous vine; leaves cordate, entire, long-acuminate; sepals green, lance-oblong, acuminate, covered near the base with long spreading hairs; corolla blue or rose-purple, 6–7 cm. long.—Frequent in thickets, especially about Progreso; known only from this region.

Ipomoea Pes-caprae (L.) Roth. *Goatfoot morning-glory.* A large coarse glabrous vine, the stout stems sometimes 10 meters long, trailing over the sand; leaves thick and leathery, rounded or oval, often notched at the apex, rounded at the base; sepals rounded, glabrous; corolla purple, 4–5 cm. long.—A common and characteristic plant of seashores, and confined to such situations; widely distributed in the tropics of both hemispheres.

Ipomoea polyanthes R. & S. A large herbaceous vine with some fine pubescence, but appearing nearly glabrous; leaves broadly cordate, entire; flowers in very dense, long-stalked umbels, the sepals rounded; corolla yellow, 2–2.5 cm. long.—Common in thickets; widely distributed in the tropics of both hemispheres. Easily recognized by the small yellow flowers. Called "batatilla amarilla" in Panama; in Salvador "cuelga-tabaco," "tripa de gallina," "cuajo de ule," and "jícama cimarrona." In the latter country the stems are used for stringing or tying tobacco leaves when they are hung to dry, and the juice of the plant is employed for coagulating rubber sap.

Ipomoea purga Hayne. A large herbaceous vine, glabrous or nearly so; leaves ovate-cordate, entire, acuminate, on short petioles, the upper leaves often nearly sessile; sepals rounded and mucronate at the apex; corolla narrow, about 7 cm. long, rose-purple.—Common in wet thickets; occurring in many parts of Mexico and Central America. Known in Salvador by the names "campanilla," "campánula," "mechoacán," and "chupamiel." The name "campanilla" (little bell) is applied generally in Central America to most species of *Ipomoea.*

Ipomoea stolonifera (Cyrill.) Poir. Stems slender, trailing and rooting at the joints; leaves small, oblong, usually with a deep lobe on each side at the base, commonly notched at the tip; sepals acute or acuminate; corolla white, 4–5 cm. long.—A characteristic plant of seashores; widely distributed in the tropics of both hemispheres. Usually growing in association with the goatfoot morning-glory.

Ipomoea splendor-sylvae House. A glabrous vine; leaves ovate-cordate, acuminate, the margins sinuate-dentate; peduncles long, 1–3-flowered, the sepals 8–10 mm. long, obtuse or rounded at the apex; corolla "scarlet," 5–9 cm. long.—The species is known only from specimens obtained by Percy Wilson (No. 286) at "Highland Creek above Bradley's plantation," near Tela (then Puerto Sierra).

Ipomoea tiliacea (Willd.) Choisy. Glabrous or sparsely pubescent; leaves broadly cordate, entire, acuminate; flower clusters long-stalked; sepals broad, mucronate; corolla 5–6 cm. long, purple, pink, or white, often with a dark eye.—Common in thickets; widely distributed in tropical America. Called "churristate" in Costa Rica, and in Salvador "campanola" and "manto de Jesús."

Ipomoea Wilsoni House. A large herbaceous vine, nearly or quite glabrous; leaves long-stalked, cordate, acuminate, entire or rarely deeply lobed; sepals glabrous, obtuse or rounded at the apex; corolla rose-purple, 7–8 cm. long.—Common in wet thickets; known only from this region, the type specimens having been collected by Percy Wilson (No. 530) on the "road to Río Plátano," near Tela. The plant is a very showy and handsome one.

MARIPA Aubl.

Maripa nicaraguensis Hemsl. A large woody vine; leaves short-petioled, oblong to oval, rounded or short-acuminate at the apex; flowers 3–4 cm. long, arranged in stalked many-flowered cymes, the corolla densely hairy outside; fruit indehiscent.—In swamps, infrequent; ranging from Nicaragua to British Honduras.

OPERCULINA Manso

The plants listed under this genus resemble the species of *Ipomoea*, but the capsule opens by a lid, rather than the vertical valves characteristic of *Ipomoea*.

Operculina dissecta (Jacq.) House. A small herbaceous vine, the stems and petioles with long stiff spreading hairs; leaves deeply 5-lobed, the lobes again deeply lobed; corolla white, about 3.5 cm. long.—Occasional in thickets; widely dispersed in the tropics of both hemispheres.

Operculina tuberosa (L.) Meissn. A large glabrous herbaceous vine; leaves long-stalked, deeply 7-lobed, the lobes narrow, entire; sepals broad, obtuse, in fruit becoming 4–6 cm. long; corolla bright yellow, about 5 cm. long; capsule globose, about 3 cm. broad.—Occasional in wet thickets; widely distributed in the tropics of both hemispheres. The name "mala hierba" is said to be given to the plant in some parts of Honduras, and the large fleshy roots are reported to be poisonous to stock. In Panama the vine, which is a highly ornamental one, is well known by the name "Tivoli vine."

Porana paniculata Roxb., a native of the East Indies, is planted at Lancetilla as an ornamental, and is found occasionally in cultivation in Central America. It has heart-shaped leaves which are finely pubescent beneath, and very numerous white flowers about 5 mm. long, arranged in dense panicles. The English name "Christmas vine" is sometimes applied to it.

QUAMOCLIT Moench

Quamoclit pennata (Desr.) Bojer. A glabrous herbaceous vine; leaves pinnately parted into numerous linear lobes; flowers in long-stalked clusters, the corolla bright red, its slender tube 2.5–4 cm. long, abruptly expanded into the broad limb.—Occasional in thickets, doubtless introduced here; widely distributed in the tropics of both hemispheres. Usually called "cundeamor" in Central America, and known in Salvador also as "clavellina." The plant often is grown for ornament in the United States under the name "cypress vine."

RIVEA Choisy

Rivea campanulata (L.) House. A large vine, herbaceous or somewhat woody; leaves long-stalked, broadly cordate, large, entire, often purple beneath; corolla pink, 7–8 cm. long; sepals enlarged in fruit; fruit somewhat fleshy, indehiscent, 2–2.5 cm. broad, enclosed in the sepals.—In wet thickets; widely dispersed in the tropics of the Old and New Worlds. Called "batatilla" in Panama, where the sap is employed for coagulating rubber.

CUSCUTACEAE. Dodder Family

CUSCUTA L.

Cuscuta americana L. *Hierba mala. Dodder.* A slender glabrous parasitic herb, twining about the stems of other herbaceous plants, the stems deep yellow; leaves reduced to minute scales; flowers 3–4 mm. long, in small racemes or cymes, the corolla cylindric, with 5 short lobes; stamens 5, inserted in the throat of the corolla; fruit a small globose capsule containing 1 or 2 seeds.—Collected at Progreso, and probably frequent in the region; widely distributed in tropical America. The seeds germinate in the soil, and the young plant soon attaches itself to its host, after which the roots and lower part of the dodder stem wither, the plant obtaining all its nutriment from the host. In Honduras the plants are reputed to be poisonous to stock.

HYDROPHYLLACEAE. Waterleaf Family

WIGANDIA HBK.

Wigandia caracasana HBK. A branching shrub about 2 meters high, densely and softly pubescent, sometimes wholly herbaceous; leaves large, alternate, petioled, oval, shallowly toothed, cordate at the base; flowers large and showy, arranged in cymes, the branches one-sided; calyx 5-parted; corolla funnelform-campanulate, 1–2 cm. long, of united petals, the 5 stamens inserted on the corolla, exserted; styles 2; fruit a one-celled two-valved capsule.—Noted only in thickets in the Guaymas district, but doubtless growing elsewhere; ranging to Mexico and Venezuela. Called "chocón" in Guatemala, "tabaquillo" in Salvador, and "pringamoza" in Colombia. The purple flowers are showy, but the plant is a coarse and unattractive one.

BORAGINACEAE. Borage Family

In northern regions this family consists chiefly of herbaceous plants, but the tropical members of the group are mostly shrubs and trees. They have alternate or rarely opposite, entire or toothed, frequently very rough leaves without stipules. The perfect flowers are small or large, with superior ovary, the corolla of united petals and usually 5-lobed. The stamens are as many as the corolla lobes, and inserted alternate with them on the tube of the corolla. The fruit is a drupe or is composed of 2 or 4 dry nutlets.

CORDIA L.

The Cordias are shrubs or trees, sometimes attaining a large size. The leaves are entire or toothed, and usually with rough

pubescence. The flowers are small or large, usually white, and panicled or arranged in spikes or heads, and the fruit is a fleshy drupe.

Cordia alba (Jacq.) R. & S. *Chachalaco.* A small or medium-sized tree with low, rounded or spreading crown; leaves ovate to rounded, rounded to acute at the tip, inconspicuously toothed or nearly entire, very rough; flowers white, about 1 cm. long, in large panicled cymes; calyx 3–4 mm. long, 10-ribbed; fruit white, about 1 cm. long.—Frequent in thickets about Progreso, not noted near Tela; widely distributed in Central America, especially on the Pacific slope. Known in Salvador as "tigüilote," and "cebito"; in Panama as "uvillo," "uvero," and "goma." The wood is reported as hard and strong, yellow, and rather heavy. It is little used in Central America except for fuel. In the drier regions along the Pacific slope at low elevations this tree often forms extensive forests or thickets, and it is one of the trees most abundant along roadsides. When in blossom it is rather showy, but on the whole it is a most unattractive tree. It is called "jackwood" in British Honduras.

The fruits are translucent; their pulp is very sticky and extremely sweet. It is relished by birds, and children also eat it. Various medicinal properties are attributed to the flowers and other parts of the tree.

Cordia alliodora (R. & P.) Cham. *Laurel* (Spanish name). A large or medium-sized tree, the pubescence of minute stellate hairs; leaves mostly elliptic-oblong, acuminate, entire, slightly rough; flowers small, white, fragrant, in large panicles; calyx 5 mm. long, 10-ribbed; fruit small, white.—Occasional in thickets and low forest throughout the region, but not so plentiful here as in some other parts of Central America; widely distributed in tropical America. The names "laurel blanco" and "laurel negro" also are in use in Honduras, and in British Honduras the tree is called "salmwood." The foliage, when crushed, has an odor suggestive of garlic. The tree is easily recognized among the Central American Cordias by the fine stellate pubescence, and also by the fact that the joints of the branchlets are enlarged, as if affected by rheumatism, and the hollow spaces within them are inhabited by small but very active ants which bite savagely and cause severe pain. It is rarely that one finds a tree of this species free of ants. The tree is a very handsome one when in flower. The wood is yellow to brown, often more or less streaked, rather light and soft, but firm, to moderately

heavy, tough and strong, easy to work, and not very durable when in contact with the ground. It is valued for general construction purposes and also for cabinet work. The "laurel," as it is usually known, is one of the most common trees of Central America, especially in the drier regions at low altitudes.

Cordia diversifolia Pav. *Tigüilote.* A small tree or a shrub only 3 meters high, the branchlets coarsely hairy; leaves mostly elliptic-oblong, acuminate, entire, very rough; flowers white, nearly 1 cm. long, in small panicles; calyx 5 mm. long, 10-ribbed.—Occasional in thickets about Lancetilla; ranging to Panama and Mexico. The name "chachalaco" is reported from Cuyamel, Honduras. Called "upay" in Guatemala and "tigüilote" in Panama. The wood is reported as grayish and moderately hard, but it is too small to be utilized.

Cordia ferruginea (Lam.) R. & S. *Carne asada.* A shrub 1.5–2.5 meters high, the branches often recurved and straggling; leaves oblong to ovate, acute, slightly roughened on the upper surface; flowers very small, greenish white, in long, slender, usually interrupted spikes.—A common weedy shrub of thickets and swamps; widely distributed in tropical America. It is said to be called "stick-together" by the West Indians of this region, and in Guatemala it is known as "bejuco negro."

Cordia Gerascanthus L. *Laurel negro.* A large tree; leaves mostly elliptic-oblong, acute or acuminate, entire, glabrous and smooth; flowers white, fragrant, in dense cymes; calyx 7–10 mm. long, 10-ribbed; corolla twice as long as the calyx.—Frequent in forests; occasional along the Atlantic coast of Central America, also in the Antilles. Called "baría" in Tabasco. The wood is variegated in various shades of brown, with black markings, the sapwood gray; it is very hard and heavy, of medium texture, tough and strong, rather difficult to cut, not easy to split, takes a good polish, and is durable. It is considered one of the good woods of the Central American coast and is valued for cabinet work and for various construction purposes.

Cordia nitida Vahl. *Sombra de ternero.* A small or medium-sized tree; leaves mostly elliptic or sometimes oblong, entire, acute or acuminate, usually nearly glabrous and smooth but frequently slightly roughened; flowers white, about 5 mm. long, in small panicled cymes, faintly fragrant; fruit creamy white, 1–1.5 cm. long.—Occasional in thickets and forest; in Central America ranging to Panama.

The wood is described as white, not close-grained but medium hard and heavy.

Ehretia microphylla Lam., an Old World shrub, has been planted for ornament about Lancetilla and Tela. It has small, rough, oblanceolate, coarsely toothed, dark green and shining leaves, and small white flowers in slender-stalked few-flowered cymes.

HELIOTROPIUM L.

The local species of this genus are weedy herbs or low shrubs with harsh pubescence. The small flowers are arranged in long curved one-sided spikes. The fruit is hard, dry, and nutlike.

Heliotropium indicum L. *Cola de alacrán* ("scorpion-tail"). A coarse herb a meter high or less, densely hairy; leaves ovate or broadly ovate, acute, crenate; flowers purple, 3 mm. long.—Infrequent in this region, except about Progreso; one of the common weeds of some parts of Central America. Known in Panama as "flor de alacrán," in Costa Rica as "lagartillo," and in Salvador as "hierba de alacrán," "pico de zope," and "borraja de la tierra."

Heliotropium transalpinum Vell. *Cola de alacrán.* A bushy herb or shrub about a meter high; leaves elliptic-oblong, acuminate, but little roughened; flowers very small, greenish white.—Occasional about Tela and Progreso, in fields or thickets; a weedy plant, ranging to South America.

TOURNEFORTIA L.

The Tournefortias are shrubs, rarely erect but commonly reclining on other plants or even with a tendency to climb. The small and unattractive flowers are arranged in one-sided curved spikes which form cymes or panicles. The leaves are entire.

Tournefortia bicolor Sw. A shrub or a large woody vine; leaves oblong, acute, glabrous; flowers white, 8 mm. long, the corolla lobes broad and obtuse; fruit 4 mm. long, juicy, white.—In swamps or thickets near the coast; widely distributed in Central America.

Tournefortia Billbergiana Beurl. A woody vine or a low shrub; leaves mostly elliptic or ovate, acuminate, roughened and sparsely pubescent; flowers greenish white, 12 mm. long, the corolla lobes broad and obtuse; fruit globose, white, about 4 mm. long.—Common in thickets; ranging to Panama.

Tournefortia glabra L. An erect shrub, but often with recurved branches or even tending to climb; leaves large, elliptic-oblong or elliptic, long-acuminate, nearly glabrous; flowers pale green, 6–7 mm. long, in very long and slender spikes, the corolla lobes linear-lanceolate and attenuate; fruit scarcely 3 mm. long, white.—Common in thickets; widely distributed in Central America and the West Indies.

VERBENACEAE. Verbena Family

The verbena family consists of herbs, shrubs, and trees, the woody forms being most abundant in tropical America. The leaves are chiefly opposite and simple, and either toothed or entire. The small or large flowers are variously arranged and either regular or irregular; the ovary is superior, the calyx 2–5-lobed, and the corolla with 4 or 5 lobes. The stamens are usually 4 and in pairs, occasionally 2 or 5. The fruit is a fleshy drupe, or dry and separating at maturity into 2 or 4 nutlets. The verbenas cultivated for ornament belong to the genus *Verbena* of this family. Two species of *Verbena*, both inconspicuous weeds, grow in the interior of Honduras.

The black mangrove (*Avicennia nitida* Jacq.) surely grows in the mangrove swamps of this region, but I did not find it anywhere about Tela. It is one of the common trees of mangrove swamps, easily recognized by its narrow whitish leaves.

AEGIPHILA Jacq.

The Aegiphilas are shrubs or small trees with entire leaves. The flowers have exserted stamens and a corolla with spreading limb. The fruit is a fleshy drupe.

Aegiphila elata Sw. A shrub or small tree 3–6 meters high, the branches sometimes long and trailing; leaves short-petioled, oblong to broadly elliptic, acuminate, rounded at the base, glabrous or nearly so; flowers pale yellow, nearly 1 cm. long, in large terminal panicles; fruit globose, deep yellow, 1 cm. in diameter.—Frequent in wooded swamps and coastal thickets about Tela, and elsewhere along the Honduran coast; also in the West Indies.

Aegiphila fasciculata Donn. Smith. *Vara blanca. Plate LVII.* A shrub or tree 3–6 meters high, the branches pale, obtusely 4-angled, hollow; leaves very large, long-stalked, usually broadly elliptic, acute or acuminate, narrowed to the base, nearly glabrous; flowers small, pure white, in small clusters in the axils of the leaves and below the leaves on the naked branches; fruits globose, about 8 mm. in diame-

ter.—Common in thickets; ranging to British Honduras. The flowers are rather handsome, closely suggesting at a short distance those of coffee. The branches are exceedingly brittle and may be broken from the plant with little effort. The wood, such as it is, is pinkish gray, very light and soft, and medium-textured.

CALLICARPA L.

Callicarpa acuminata HBK. A shrub or small tree, sometimes 6 meters high, the pubescence of dense fine stellate hairs; leaves short-stalked, mostly oblong-elliptic, acuminate, coarsely toothed; flowers small, white, 3 mm. long, in dense forking cymes springing from the leaf axils; fruit fleshy, black, 5 mm. in diameter.—Occasional in swamps and thickets along the coast; ranging to Panama and Mexico. The name "vara de alcalde" is reported from Honduras.

CITHAREXYLUM L.

The species of this genus are shrubs or small trees, their leaves entire or nearly so. The small white flowers are arranged in long slender racemes. The fruit is a fleshy drupe.

Citharexylum caudatum L. A glabrous shrub or tree 1.5–4.5 meters high, the stems rounded in cross section; leaves narrowly oblong, mostly obtuse, somewhat leathery; flowers 5 mm. long; fruit globose, 6 mm. in diameter, at maturity black and shining.—Common in coastal thickets; ranging along most of the Atlantic coast of Central America. Called "manglillo" in Panama. The shrub is a rather showy one when the fruit is ripe. The immature fruits often are tinged with bright red.

Citharexylum hirtellum Standl. A shrub about 1 meter high, the stems 4-angled; leaves elliptic-oblong, obtuse or acute, minutely rough-pubescent; flowers white, 6 mm. long, in short spikes.—Seen only in a pasture at La Fragua, where the plant appeared to be introduced; also in British Honduras.

CLERODENDRON L.

Clerodendron Thomsonae Balf. A vine with clusters of showy flowers having a white calyx and red corolla.—Planted sometimes for ornament; native of India. Known in Salvador by the names "misteriosa" and "ala de ángel."

CORNUTIA L.

Cornutia grandifolia (Schlecht. & Cham.) Schauer. *Cucaracho.* A shrub or small tree 2–7.5 meters high, the branches square in cross

section; leaves large, ovate or elliptic, long-acuminate, entire or nearly so, densely soft-hairy on both surfaces; flowers violet, 1.5 cm. long, in large narrow panicles, the corolla 2-lipped; fruit a small globose drupe.—Common in thickets; widely distributed in Central America. The name "zopilote" is reported from Cuyamel, Honduras. In Panama the plant is called "palo cuadrado" and "cuatro caras," in Salvador "zapalote." The tree is a very conspicuous one during the spring months when covered with its handsome flowers.

LANTANA L.

The Lantanas are shrubs with 4-angled stems and with petioled, ovate to lanceolate, toothed leaves. The small but brightly colored flowers are arranged in long or short and headlike spikes in the axils of the leaves. The fruits are small and fleshy.

Lantana Camara L. *Cinco negritos.* A coarse shrub about a meter high, the stems hairy and armed with short stout recurved prickles; leaves opposite; flowers in short headlike spikes on long slender stalks; corolla usually yellow at first, but soon turning red; fruit of 4 small black juicy drupes.—Frequent in thickets; widely distributed in tropical America. Known in Panama as "pasarín," "hierba zorra," and "San Rafaelito"; in Guatemala as "cinco coloraditos" and "corronchocho"; in Costa Rica as "jaral" and "jarilla." The fruit is sweet and edible, but it is rarely eaten by human beings. The flowers are noteworthy for the changes in color which they exhibit in age. About Lancetilla two forms are in evidence, one in which the corollas are at first yellow but later turn red, and one in which the flowers are constantly orange-yellow.

The lantana was carried to Europe at an early date, presumably because of its brightly colored flowers, although certainly there are many other common plants of tropical America which are much more worthy of cultivation. Horticulturists have developed varieties much superior to the wild forms, which are now common in cultivation in the United States and elsewhere. In some parts of the Old World tropics the lantana has become established as a troublesome weed.

Lantana trifolia L. *Juanilama, Cinco negritos.* A shrub 1–1.5 meters high, the stems simple or branched, unarmed; leaves mostly in whorls of 3, oblong-lanceolate; flower spikes elongated, the corollas purple; fruits purple.—Occasional in thickets; widely distributed in tropical America. Called "icaquito" in Salvador. The crushed leaves have an aromatic odor.

LIPPIA L.

The *Lippia* species known from this region are all low herbs, but elsewhere in Honduras some of them are shrubs or trees. *L. Kellermanii* Greenm., a handsome tree 6 meters high, grows at Siguatepeque. The local species have coarsely toothed leaves. Their minute, white or whitish flowers are arranged in very dense, cylindrical spikes on long stalks in the axils of the leaves. The fruit is dry.

Lippia betulaefolia HBK. A low ascending herb; leaves broadly ovate, with large coarse broad teeth; flower heads usually 4 or more at each node.—Found in an open field at La Fragua; frequent in some parts of Central America. The stems are hollow. The flowers in this species are greenish rather than white.

Lippia nodiflora (L.) Michx. An herb with long creeping stems, rooting at the joints; leaves narrowly oblong, with a few sharp teeth toward the tip; flower spikes usually elongated.—Common on beaches, rooting in the sand; widely distributed in tropical America, and extending northward to the United States. Called "lechuga de laguna" in Salvador.

Lippia reptans HBK. Plants procumbent and rooting at the joints; leaves rhombic-ovate, obtuse, with numerous coarse acute teeth; flower spikes short and headlike.—Occasional in fields or thickets; frequent in various parts of Central America. The bracts of the heads frequently are purple, and contrast vividly with the white corollas.

PRIVA Adans.

Priva lappulacea (L.) Pers. *Mozotillo.* A decumbent herb with branched stems, the short pubescence partly of hooked hairs; leaves long-stalked, triangular-ovate, acuminate, coarsely toothed; flowers purple, 3–4 mm. long, arranged in long slender racemes; fruit of 2 prickly nutlets enclosed in the enlarged green calyx.—A common weed in waste places; widely distributed in tropical America. Known in Panama as "cadillo"; in Salvador as "mozote," "mozote de gallina," and "mozote de pollo." The burlike nutlets and calyx adhere to clothing and to the hair of animals by their fine hooked hairs. The plant is one of the common dooryard weeds of Central America.

STACHYTARPHETA Vahl

The plants are branched herbs or shrubs with oblong to ovate, coarsely toothed leaves. The flowers are arranged in long slender

spikes, the calyces being appressed to the rachis of the spike and sunken in small pits or excavations along it. The fruit consists of two one-seeded nutlets.

Stachytarpheta cayennensis (L. Rich.) Vahl. *Mozote, Verbena.* A rather slender, branched herb or shrub 1.5 meters high or less; leaves obtuse, thin, long-tapering at the base, pubescent or nearly glabrous; flower spikes very slender, the rachis 2 mm. thick; corolla blue or purple.—Frequent in fields and thickets; widely distributed in tropical America. The West Indians of the Canal Zone, who call the plant "porterweed," prepare from it a tea which is said to have the appearance of porter, and to foam in the same manner.

Stachytarpheta jamaicensis (L.) Vahl. *Verbena.* A stout, nearly glabrous herb 60 cm. high or less; leaves mostly oblong, obtuse; flower spikes stout, the rachis 4–5 mm. thick; corollas purple.—Common in sand near the beach; widely distributed in tropical America. A form with white corollas found about Tela is *S. jamaicensis* f. *albiflora* Standl. Plants with fasciated inflorescences are frequent here, their spikes being compressed and flattened and as much as 2.5 cm. wide.

VITEX L.

Vitex Kuylenii Standl. *Flor azul.* A tree of medium or large size; leaves digitately compound, the 3–5 leaflets elliptic or obovate-elliptic, short-acuminate, narrowed to the base; flowers blue, about 1 cm. long, in stalked axillary panicles; fruit a fleshy drupe.—Occasional in thickets and forest; known also from Guatemala, where it is called "Barabás" or "Barbás."

LABIATAE. Mint Family

The local representatives of this group are herbs or small shrubs, often with an aromatic odor. The stems usually are 4-sided, the leaves opposite, simple, usually toothed, and without stipules. The perfect flowers are irregular, the calyx persistent in fruit and of united sepals, the corolla small or large and commonly 2-lipped. The fruit consists of 4 small nutlets placed in the bottom of the calyx.

COLEUS Lour.

Coleus Blumei Benth. *Manto de la reina. Coleus.* A coarse fleshy herb, the leaves usually variegated with red, yellow, and purple; flowers small, violet.—Cultivated commonly and sometimes growing as a weed; native of tropical Asia. The common garden

coleus is one of the well-known ornamental plants of Central America. In Panama it is called "pompolluda" and "chontadura."

HYPTIS Jacq.

These plants are herbs or shrubs with toothed leaves. The small and inconspicuous flowers, arranged in heads, spikes, or dense cymes, are nearly always white.

Hyptis brevipes Poit. A branched herb a meter high or less, sparsely pubescent; leaves mostly lanceolate, petioled; flowers in very dense, globose heads about 1 cm. in diameter, borne on very short stalks in the leaf axils, the bracts small and inconspicuous.—In wet fields about Tela, scarce; widely distributed in tropical America.

Hyptis capitata Jacq. A coarse, sparsely pubescent, branched herb about a meter high; leaves coarsely toothed, narrowed to the base; flowers in long-stalked globose heads 2 cm. or more in diameter, the head surrounded by long narrow leaflike bracts.—A common weed in thickets and waste ground; widely dispersed as a weed in tropical America. Called "suspiro de monte" in Panama, and in Salvador "chivola."

Hyptis pectinata (L.) Poit. A coarse branched herb 1–1.5 meters high, finely pubescent; leaves slender-petioled, coarsely toothed, rounded at the base; flowers very small, in dense headlike cymes arranged in long racemes.—A weed in garden at Lancetilla, probably introduced here; one of the common and widely distributed weeds of tropical America.

Hyptis verticillata Jacq. *Barrehorno, Verbena.* A slender, densely branched shrub 1–1.5 meters high, nearly glabrous; leaves short-petioled, lanceolate, sharply toothed; flowers very small, arranged in long, slender and interrupted, spikelike racemes.—Common in thickets; widely distributed in tropical America. The plant is much used in Central America as a domestic remedy for a great variety of ailments. In Panama it is called "paleca" and in Salvador and some parts of Honduras "verbena."

MARSYPIANTHES Mart.

Marsypianthes Chamaedrys (Vahl) Kuntze. A prostrate much-branched annual, copiously pubescent; leaves small, slender-stalked, ovate, coarsely crenate; flowers small, purple, in large, very dense, short-stalked heads.—On open banks near Tela, apparently rare in

this region; widely distributed in tropical America. Known in Salvador by the name "zompopo" (the native name of the leaf-cutting ants).

MICROMERIA Benth.

Micromeria Brownei (Sw.) Benth. A perennial herb with very slender, branched, erect or ascending stems, glabrous or nearly so; leaves about 1 cm. long, rounded, shallowly toothed; flowers pale purple, slender-pediceled in the leaf axils, the tubular calyx 5 mm. long.—Noted only in a pasture near Lancetilla, where it is probably introduced; widely distributed in tropical America. The plant has a strong odor like that of the pennyroyal (*Hedeoma pulegioides*) of the United States.

OCIMUM L.

Ocimum micranthum Willd. *Albahaca. Wild basil.* An erect bushy-branched herb usually 30–60 cm. high, finely pubescent; leaves slender-petioled, ovate, acute, abruptly narrowed at the base, the margins with low appressed teeth; flowers arranged in whorls in a thick raceme; calyx about 1 cm. long in fruit, reflexed, the upper lip decurrent in two broad wings upon the tube.—Occasional in pastures and thickets; widely distributed as a weed in tropical America. The strongly scented leaves are sometimes employed for flavoring food. In Honduras a tea made from them is administered as a remedy for pains in the stomach. To this same genus belongs the Old World basil (*Ocimum Basilicum*), which is grown in Central American gardens for its aromatic foliage.

SALVIA L.

This genus is a very large one in Mexico, but in Central America there are comparatively few species. The local ones are inconspicuous weeds.

Salvia occidentalis Sw. A low herb with procumbent and rooting branches, more or less pubescent; leaves small, ovate or rhombic, acute or obtuse, crenate; flowers blue, 3 mm. long, in long interrupted spikelike racemes, the inflorescence very viscid.—A common weed of waste ground; widely dispersed in tropical America. The plant is a disagreeable weed, for it has an unpleasant odor, and the sticky calyces adhere persistently to clothing and to the feathers of birds. In Panama it is called "corrimiento" and "cansa-perro," in Costa Rica "verbena," and in Salvador "mozote de gallina," "trencilla negra," "mozote de pollo," and "gonce de gallina."

Salvia tiliaefolia Vahl. A much-branched bushy erect herb, usually about a meter high; leaves glabrous or nearly so, long-stalked, ovate or broadly ovate, acute, crenate or finely toothed; flowers pale blue or bluish, nearly 1 cm. long, in long slender naked racemes, the calyx not viscid.—Frequent in thickets; rather widely distributed in tropical America.

TEUCRIUM L.

Teucrium inflatum Sw. An erect or ascending perennial herb, commonly about 60 cm. high, the stems with long slender spreading hairs; leaves long-petioled, ovate, coarsely crenate; flowers small, pale purple, in dense spikelike racemes, the calyx somewhat inflated, white-hairy.—Frequent in swamps and thickets, also a weed in banana plantations; widely distributed in tropical America.

SOLANACEAE. Potato Family

The family Solanaceae is a large and important one which is particularly well developed in the tropics. The plants are herbs, shrubs, or small trees, their pubescence often of branched hairs. The leaves are alternate, without stipules, and either simple or compound. The flowers are perfect, small or large and showy, variously arranged, regular or nearly so, the corolla of united petals. There are commonly 5 stamens, which are inserted on the corolla tube. The ovary is normally 2-celled, and the fruit is a capsule or, as in most of the genera here listed, a berry.

CAPSICUM L.

The species of *Capsicum* are herbs or small shrubs, their stalked leaves entire or nearly so. The small whitish flowers are on slender stalks which are solitary or clustered in the axils of the leaves; the calyx is truncate or has 5 inconspicuous teeth. The fruit is technically a berry of variable size and appearance.

Capsicum annuum L. *Chile. Pepper.* The common garden pepper, with large fruits of various shapes and colors, is grown in gardens. It is really only a cultivated form which doubtless has been derived from the wild *Capsicum frutescens* through long centuries of cultivation. Chile is used currently for flavoring food in Honduras, but not nearly so frequently as in Mexico. Except in Guatemala, chile is not used to excess in Central America, and in some regions it is seldom employed in the kitchen.

Capsicum frutescens L. *Chile, Chile bravo. Wild pepper.* A densely branched shrub or herb usually about a meter high, finely

pubescent or nearly glabrous; leaves slender-stalked, ovate, long-acuminate; flowers small, greenish white; fruit small, berrylike, ovoid or oblong.—Occasional in thickets; perhaps only escaped from cultivation. The plant differs from the large-fruited garden pepper only in its small fruits, which are of intensely pungent flavor.

Capsicum frutescens, var. **baccatum** (L.) Irish. *Chiltepin, Chilpepe, Chiltepe. Cayenne pepper, Bird pepper.* Like the preceding form except that the small fruits are globose and cherrylike; sometimes growing as a shrub 2 meters high.—Frequent in thickets, pasture, or even in forest; widely distributed in tropical America, where the forms listed above also are native. The tiny fruits of this plant are intensely hot, and they are much used for flavoring food. Some bushes of this form grew in front of the cottage in which I lived while at Lancetilla, and it was interesting to watch certain birds which came nearly every afternoon to gather the peppers as they ripened. The birds swallowed them whole, and evidently relished them, for they never left a ripe fruit long on the bush.

Capsicum macrophyllum (HBK.) Standl. A stout bushy erect herb about a meter high; leaves large, elliptic-oblong to ovate, acuminate, with some fine pubescence but appearing glabrous; flowers small, greenish yellow, in dense clusters in the leaf axils; corolla densely and minutely pubescent; fruit globose, bright red, 5 mm. in diameter.—Occasional in thickets and wooded swamps; widely distributed in Central America. Known in Panama as "pintamora de monte," and in Guatemala as "hoja de zope," "quilete," and "hierba de San Antonio." In general appearance the plant is very different from the true peppers. It is rather ornamental when loaded with the showy berries.

CESTRUM L.

The Cestrums are shrubs or small trees with rather narrow, stalked, entire leaves. The white or greenish, tubular flowers are clustered in the axils of the leaves. The fruit is a small juicy berry. There are numerous species of the genus in Central America, and some of them have been introduced into cultivation in foreign countries.

Cestrum macrophyllum Vent. A shrub 3–4.5 meters high; leaves large, elliptic-oblong, acuminate, long-tapering to the base; flowers greenish white, often clustered on old naked branches; berries white or purple.—Occasional in wet thickets; widely distributed in Central America, but not very common.

Cestrum nocturnum L. *Huele de noche.* A slender shrub or small tree 1.5–4.5 meters high, glabrous or nearly so; leaves thin, bright green, elliptic to oblong, acute, at the base acute or obtuse; flowers pale green, 2 cm. long; berries white, 6–7 mm. long.—Common in thickets; widely distributed in Central America. Called "palo hediondo" in Salvador, and in Guatemala "galán de noche" and "reina de la noche." The flowers are very fragrant, especially at night.

Cestrum panamense Standl. *Huele de noche. Plate LVIII.* A tree 4.5–9 meters high, the trunk sometimes 30 cm. in diameter, the crown tall and narrow; leaves thin, bright green, lance-oblong, long-acuminate, usually rounded at the base or sometimes merely obtuse; flowers pale green, 1.5 cm. long; berries white.—Frequent in wet thickets; ranging to Panama, where it is called "hiede-hiede."

CYPHOMANDRA Sendtn.

Cyphomandra mollicella Standl. *Plate LIX.* Usually a treelike shrub 2–3 meters high, with a clean trunk and a dense spreading crown; leaves dimorphous, large, thick, the lower ones pinnately lobed, the upper broadly ovate and entire, cordate at base, acuminate, finely pubescent beneath or nearly glabrous; flowers green, in few-flowered one-sided racemes in the axils of the leaves, the racemes recurved and in age elongating, the corolla with 5 narrow lobes; fruit a large berry.—Occasional in wet thickets and in pastures; ranging to Panama, where the plant is called "monca prieta." In Panama the leaves are applied as poultices to sores and wounds. The plant is a rather handsome one when growing in open places because of its neat treelike habit and its attractive leaves. I am inclined to believe that it is really a large herb, the whole plant springing up each year, although in Panama it is reported to reach a height of 7.5 meters, with a trunk 10 cm. in diameter.

DATURA L.

Datura candida (Pers.) Pasq. *Maracunda. Angel-trumpet.* A bushy shrub with large, nearly entire leaves; flowers very large, pendent, trumpet-shaped, white, fragrant.—Planted in Tela and elsewhere; a species of doubtful origin. Called "reina de la noche" in Costa Rica, and in most parts of Central America "floripondio." About Tela the flowers are reported to be placed under or near one's pillow, as a remedy for insomnia. The narcotic properties of the Daturas are well known.

According to reports made to me, it is probable that *D. Stramonium* L., the common Jimson-weed, is found occasionally about Tela. The vernacular name was given as "tapa," the term usually applied to the plant in Central America.

LYCIANTHES Hassler

The species of *Lycianthes* until recently have been referred to the genus *Solanum*, but they make a very natural and well-defined segregate from that vast group. They are mostly shrubs but sometimes herbs. The calyx is truncate and often provided with 5–10 short or long and filiform appendages; the calyx in *Solanum* is regularly 5-lobed. The fruit of *Lycianthes*, as in *Solanum*, is a berry. The plants belonging to the genus *Lycianthes* are always unarmed.

Lycianthes amatitlanensis (Coult. & Donn. Smith) Bitter. An herb or shrub 1 meter high or less, the stems usually unbranched; leaves of a pair very unequal, the larger one several times as large as the smaller, lanceolate or oblong, large, long-acuminate, very unequal at the base, hirsute on both sides with simple or fascicled hairs; flowers clustered in the leaf axils, the calyx with 10 filiform appendages; corolla small, pale yellow; berries bright red, 8 mm. in diameter.—Frequent in dense wet mountain forest; also in Guatemala. The leaves are conspicuously distichous, that is, all spreading in the same plane.

Lycianthes lenta (Cav.) Bitter. A small woody vine; leaves subequal, slender-stalked, broadly ovate, acute or obtuse, rather small, minutely pubescent or nearly glabrous; flowers clustered in the leaf axils, slender-stalked, 2 cm. long, the corolla bright purple.—Collected in thickets about La Fragua; widely distributed in tropical America. In Salvador the plant is called "guaco," "manzana montés," and "quesillo." It is rather handsome when in full flower.

Lycianthes nitida Bitter. A glabrous shrub 1–1.5 meters high, sometimes epiphytic; leaves very unequal, the larger ones oblong or elliptic-oblong, large, acuminate, acute at base, rather thick, bright green, shining; flowers densely clustered in the axils, slender-stalked, 1 cm. long, the corolla pale purplish green within.—Occasional in wet forest near the summits of the hills about Lancetilla, either terrestrial or epiphytic; also in Guatemala. The smaller leaves of each pair are very different from the larger ones, being small and rounded.

Lycianthes quichensis (Coult. & Donn. Smith) Bitter. A slender erect herb a meter high, or sometimes scandent and becoming

somewhat woody; leaves unequal, the larger ones oblong-elliptic, acuminate at each end, sparsely pubescent with short, mostly appressed hairs; flowers solitary, on very long and slender pedicels, the corolla white.—Occasional in wet thickets toward the coast; also in Guatemala.

Lycianthes synanthera (Sendtn.) Bitter. A slender shrub 1.5–3 meters high with brittle branches, glabrous or nearly so; leaves large, bright green, thin, elliptic to oblong-ovate, long-acuminate, narrowed to the base, short-stalked; flowers few, solitary or in pairs in the leaf axils, slender-stalked; berries about 1 cm. in diameter.—Occasional in wet mountain forest; rather frequent along the Atlantic coast of Central America.

Lycianthes vulpina Standl. *Plate LX.* A woody vine sometimes 3 meters long, the slender stems covered with dense branched brown hairs; leaves short-stalked, ovate to elliptic, acuminate, obtuse at the base, densely covered on both surfaces with coarse stellate hairs; flowers white, solitary or in pairs in the leaf axils; calyx densely long-hairy, with 10 long filiform appendages; fruit orange-red or white.—Frequent in wet thickets; known only from this region.

LYCOPERSICON Mill.

Lycopersicon esculentum Mill. *Tomate. Tomato.* The wild form of the tomato, with cherrylike fruits, occurs occasionally as a weed in thickets and waste places. Tomatoes, of course, are grown throughout Central America in gardens, and they are natives of tropical America. The name "tomatillo" is sometimes given to the small-fruited wild forms.

NICOTIANA L.

Nicotiana Tabacum L. *Tabaco. Tobacco.* Tobacco, a plant native in tropical America although probably not occurring now in a truly wild state, is grown here and there on the coast of Honduras. In some localities in the interior it is produced upon a larger scale, the tobacco of Copán, Honduras, being widely famous because of its excellent quality. The use of tobacco was well known to the aboriginal inhabitants of Mexico and Central America, and it is almost universally used by their descendants, especially in the form of cigarettes.

PHYSALIS L. Ground-cherry

The ground-cherries are herbs with weak stems. The leaves are long-stalked and either entire or toothed. The flowers, produced in the axils of the leaves, have a bell-shaped corolla, usually greenish yellow and with a dark red or brown eye. The calyx enlarges greatly after the flowering period and becomes inflated, enclosing the globular, greenish or yellowish berry. In some regions the fruits are cooked and eaten, and they are edible even when raw, although not of attractive flavor. Numerous species of the genus grow in the United States.

Physalis angulata L. An erect or spreading annual; leaves broadly ovate or rhombic, coarsely toothed, nearly glabrous, obtuse at the base; calyx in fruit 2–3 cm. long, 5-angled; corolla pale yellow with a dark brown eye.—Common in fields and thickets; widely distributed in tropical America. Known in Guatemala as "miltomate," and in Salvador as "huevo de tortuga," "huevillo," and "bomba."

Physalis Lagascae R. & S. An erect or procumbent, annual or perhaps sometimes perennial herb; leaves small, broadly ovate, entire or nearly so, usually rounded at the base; corolla pale greenish yellow with a maroon eye; calyx in fruit 1.5 cm. long.—Common in open places and in thickets, frequent in banana plantations; widely distributed in tropical America. Called "huevos" in Salvador, and "topetón" and "hierba de sapo" in Panama.

Physalis pubescens L. *Tomatillo.* An erect bushy herb sometimes a meter high, densely pubescent with soft coarse hairs; leaves long-stalked, broadly ovate, entire or coarsely toothed, usually cordate at the base; corolla pale greenish yellow with a maroon or dark brown eye; calyx in fruit 2–3 cm. long.—Common in fields and thickets; a widely distributed weed of tropical America.

SOLANUM L.

The genus *Solanum* is one of the largest groups of tropical American plants, and it is rather extensively represented in Central America. The plants are herbs, shrubs, or small trees, frequently with pubescence of branched hairs, and often armed with sharp prickles. The leaves are usually simple but often deeply lobed; sometimes they are opposite, one of the pair being much smaller than the other. The flowers are variously arranged; the corolla is saucer-shaped and 5-lobed. The fruit is a small or large, usually globose

berry. Several species besides those listed here occur in the interior of Honduras.

Solanum diversifolium Schlecht. *Friega-plato.* A prickly shrub 1.5–2.5 meters high; leaves broad, angled and shallowly lobed, stellate-pubescent; flowers white, in small stalked cymes in the axils of the leaves; fruit a yellow berry 1 cm. in diameter.—Common in thickets; widely distributed in Central America and Mexico. The large flannel-like leaves are often used for cleaning dirty dishes, hence the vernacular name. The West Indians living in the Canal Zone, who call the plant "sunsumba," sometimes eat the green fruits raw with salt as a relish with codfish, one of their food staples. In Panama this species sometimes is called "huevo de gato."

Solanum Donnell-Smithii Coult. *Huevo de gato.* A large woody vine, the stems armed with stout recurved prickles and densely beset with stiff spinelike hairs which have a tuft of small hairs radiating from the tip; leaves angled, armed beneath along the midrib with small recurved prickles; berries orange, 2 cm. in diameter.—Occasional in thickets; also in Guatemala, Salvador, and Mexico. Called "huistomate" in Salvador.

Solanum Hernandesii Moc. & Sessé. A prickly shrub 2 meters high; leaves broad, angled and shallowly lobed, finely and densely stellate-pubescent; flowers white, in small stalked cymes.—Occasional in thickets; ranging to Salvador and Mexico. Known in Salvador as "huistomate" or "güistomate." This species differs from *S. diversifolium* only in having some glandular pubescence on the inflorescence, the latter species being altogether without such glands. It seems doubtful whether *S. Hernandesii* is more than a mere form of *S. diversifolium.*

Solanum hirtum Vahl. An herb or shrub about a meter high, thickly armed with long straight prickles; leaves angled and shallowly lobed, covered beneath with a dense whitish tomentum of branched hairs; flowers white, in small cymes; fruit globose, orange, 2 cm. in diameter, covered with long soft hairs.—An occasional weed in fields about Progreso; widely distributed in tropical America. Called "huistomate" and "huevo de gato" in Salvador. The species is easy to recognize because of the long hairs which cover the fruit densely.

Solanum jamaicense Mill. A prickly shrub 1–2.5 meters high, the prickles short and recurved; leaves nearly sessile, elliptic or rhombic, acuminate, wedge-shaped at the base, angled or shallowly

lobed, covered with a fine dense stellate pubescence; flowers white, densely clustered along the stems between the leaves; berries globose, 6 mm. in diameter, orange-red.—Frequent in thickets near the coast; widely distributed in tropical America. Known in Panama as "friega-plato" and "huevo de gato." In favorable situations the plant sometimes becomes a good-sized vine.

Solanum lanceifolium Jacq. A climbing or clambering shrub, the stems armed with short recurved prickles, stellate-pubescent; leaves ovate to oblong, acute to rounded at the base, entire or nearly so; flowers in axillary few-flowered racemelike clusters, the corolla white; berries red, 6–9 mm. in diameter.—In wet thickets, infrequent; widely distributed in tropical America.

Solanum mammosum L. *Chichihua.* A prickly bushy herb about a meter high; leaves large, lobed and angled, densely covered with long soft hairs and furnished with numerous long stiff yellowish prickles; flowers large, purple; fruit bright yellow, 5–6 cm. long, glabrous, constricted below the nipplelike apex.—Occasional in open fields; widely dispersed in tropical America. Known in Costa Rica as "pichichío," in Nicaragua as "chichita," "chichigua," "marimbita amarilla," and "chichona"; in Salvador as "chichimora"; and in Guatemala as "chicha." The name "chichigua" and its variants are derived from the Aztec word signifying a woman's breast, and evidently were applied to the plant because of the form of the fruit. About Tela the seeds of this *Solanum* are administered as a remedy for colds, and it finds other applications in domestic medicine. Its use must be attended with some danger, since the fruits are popularly reputed, probably with some basis of fact, to be poisonous.

Solanum Melongena L. *Berenjena. Eggplant.* This Old World plant is grown in the region for its edible fruits.

Solanum nigrum L. *Mora, Hierba mora. Black nightshade.* An erect bushy herb a meter high or less, sometimes becoming somewhat woody, unarmed; leaves mostly ovate, acute or acuminate, toothed or entire, finely pubescent or nearly glabrous; flowers small, white or purplish, in stalked umbels; fruit a small purple-black berry.—A common weed in fields and thickets; widely distributed in tropical America as well as in temperate regions. Called "pinta-mora" in Panama, but known in most parts of Central America by the terms employed in Honduras. In certain regions of Central America the tender young shoots are cooked and eaten as a vegetable. Although in some parts of the world the fruits of this plant are

believed to be poisonous, in others they are eaten either raw or cooked, and improved varieties are sometimes grown in gardens in the United States for their fruit, used in the form of sauces and pies. Probably there are several distinct strains of the collective species, differing to some extent in their properties.

Solanum nudum HBK. A shrub or small tree 1.5–4.5 meters high, unarmed, glabrous or nearly so; leaves elliptic or ovate, acuminate, entire, acute at the base; flowers in stalked lateral umbels, small, greenish white; berries 1 cm. in diameter.—Frequent in thickets and in forest; rather widely distributed in Central America. The crushed leaves have a strong and very offensive odor.

Solanum tuberosum L. *Papa. Potato.* This native of the Andes of South America is grown commonly in the mountains of Central America, especially in Costa Rica and Guatemala, but the tubers produced are ordinarily much smaller than those marketed in the United States. Potatoes have been planted experimentally about Tela, but they can not be expected to thrive in this climate. They are imported in large quantities from the United States for local consumption.

Solanum umbellatum Mill. *Friega-plato.* An erect unarmed shrub 2–2.5 meters high, the branches covered with short-stipitate stellate hairs; leaves oblong to oblanceolate, entire, pale and densely stellate-pubescent beneath; cymes dense, many-flowered, long-stalked, the corolla white; fruit yellow, 1–1.5 cm. in diameter.—Occasional in wet thickets; widely distributed in tropical North America. Called "tapalayote" in Salvador and "lava-platos" in Guatemala.

Solanum unguis-cati Standl. *Huevo de gato.* A large woody vine, nearly or quite glabrous, the stems closely armed with short recurved prickles; leaves deeply pinnate-lobed, prickly like the stems; flowers in small cymes, the large corolla bright blue.—In wet thickets; known only from the vicinity of Lancetilla. The plant is a handsome and conspicuous one when in flower. The formidably armed stems make impenetrable tangles in the thickets above Lancetilla.

Solanum verbascifolium L. *Friega-plato, Hoja blanca.* A shrub or tree 2–4 meters high, unarmed; leaves ovate or elliptic, entire, soft and flannel-like, densely covered with fine grayish stellate hairs; flowers white, in long-stalked cymes; fruit yellow, globose, 6–10 mm. in diameter, stellate-pubescent.—Occasional in thickets

about Tela and Progreso; widely distributed in tropical America. Called "tapalayote" in Salvador.

SCROPHULARIACEAE. Figwort Family

The local members of the family are herbs, rarely somewhat suffrutescent, with chiefly opposite and simple leaves, without stipules. The commonly small and rather inconspicuous flowers (very showy in many plants of the family growing elsewhere) are perfect and irregular, with an inferior persistent calyx having 5 or 4 sepals or lobes. The asymmetrical corolla of united petals has 5 or 4 lobes, the 2, 4, or 5 stamens being attached to it between the lobes. The fruit is a capsule. Several genera besides those listed here occur in the interior of Honduras.

BACOPA Aubl.

Low herbs, the stems terete or angled but not ridged or winged; flowers small and inconspicuous, with 4 stamens. Other species are found in the mountains of the interior. The name *Herpestis* has been used for the group by some authors.

Bacopa Monnieri (L.) Wettst. Plants glabrous, the stems rooting at the joints and often forming small dense mats; leaves small, obovate, entire, rounded at the apex, very fleshy; flowers axillary, short-pediceled, purplish.—Frequent in open marshy places near the coast; widely distributed in tropical America.

Bacopa procumbens (Mill.) Greenm. A small, ascending, glabrous, annual or perennial herb with slender stems, turning blackish when dried; leaves petioled, ovate or elliptic, acute, toothed; flowers axillary, the slender pedicels often longer than the leaves; corolla bright yellow.—In grassy fields at La Fragua; a common weedy plant of tropical America.

CAPRARIA L.

Capraria biflora L. An erect branched pubescent herb sometimes 1.5 meters high, the stems terete; leaves alternate, petioled, oblanceolate, acute, sharply toothed; flowers small, axillary, on slender pedicels, white, the corolla nearly regular.—In thickets about Progreso; not noted near Tela; a common weed of tropical America. Called "verbena" and "té silvestre" in Salvador; "cola de gallo" and "hierba té" in Panama.

ILYSANTHES Raf.

Ilysanthes inaequalis (Walt.) Pennell. A small glabrous herb, scarcely fleshy, the slender stems 4-angled, often rooting along the joints; leaves opposite, sessile, broad, entire or toothed, obtuse; flowers very small, axillary, pediceled; sepals almost distinct; corolla white, with purple or bluish throat; fertile stamens only 2.—Occasional in open marshy places; widely distributed in tropical America, and ranging northward to the United States. This is the only representative of the genus known from Central America. The species grows also in the mountains of the interior of Honduras.

SCOPARIA L.

Scoparia dulcis L. *Escobilla.* An erect bushy herb, occasionally somewhat woody at the base, much branched, the stems rounded, the whole plant glabrous or nearly so; leaves small, opposite, ovate or lanceolate, toothed; flowers small, white, solitary or clustered in the leaf axils, on short pedicels; corolla densely white-hairy within.—Common in thickets and waste places; one of the most abundant weeds of tropical America. Known in Panama as "escobilla amarga," and in Salvador as "culantro" and "culantrillo." Called "sweet broom" by some of the West Indians inhabiting the coast of Central America.

STEMODIA L.

These are rather weedy herbaceous plants, very pubescent, with opposite, crenate or serrate leaves, the stems usually not angled. The axillary flowers are small and inconspicuous.

Stemodia durantifolia (L.) Sw. An erect, sparsely branched perennial, usually 60 cm. high or less, covered with very viscid pubescence; leaves oblong or lanceolate, acute, sessile, the base broad and clasping; flowers pale purple, nearly sessile, clustered in the leaf axils.—Growing along a ditch at Quebrada Seca; one of the widely distributed weedy plants of tropical America, but in Central America seldom abundant.

Stemodia parviflora Ait. A widely branched annual, rarely more than 15 cm. high, densely pubescent; leaves slender-petioled, broadly ovate, obtuse; flowers purple, densely clustered in the axils, on very short pedicels.—An occasional weed in cultivated or waste ground; widely distributed in tropical America. Called "hierba santa" in Costa Rica, where it is said to be employed sometimes

as a remedy for toothache, but probably it is not a conspicuously effective one. Known in Salvador as "corrimiento."

Stemodia peduncularis Benth. A low, erect or decumbent annual or perennial, less than 20 cm. high, often rooting at the lower joints, densely pubescent; leaves long-petioled, broadly ovate or rhombic, crenate, obtuse; flowers on very long, slender pedicels; corolla white, with purple lines.—Occasional in thickets or waste ground; extending northward to Mexico.

TORENIA L.

Torenia crustacea (L.) C. & S. A small glabrous annual with 4-angled stems, often rooting along the lower joints of the slender stem; leaves opposite, broad, crenate or entire, obtuse, slender-petioled; flowers axillary, on very long, slender pedicels; corolla only 3–4 mm. long, purple or pale lilac; calyx of united sepals, as long as the capsule.—Occasional on open banks; widely distributed in tropical America; introduced from the Old World tropics.

VANDELLIA L.

Vandellia diffusa L. A low, prostrate or erect herb, often rooting at the lower nodes, the stems slender, 4-angled, pubescent; leaves opposite, petioled, rounded, shallowly crenate or nearly entire; flowers axillary, nearly sessile, 6–7 mm. long, the corolla white; capsule long and narrow, exserted beyond the sepals.—Occasional in wet thickets or in open fields; widely dispersed in tropical America, where it may be introduced from the Old World.

BIGNONIACEAE. Bignonia Family

This family is an essentially tropical one, although there occur even in the United States a few representatives, such as the trumpet creeper (*Campsis radicans*) and the cross-vine (*Bignonia capreolata*). The plants are trees or woody vines, their leaves either opposite or alternate and most frequently compound, the terminal leaflet sometimes replaced by a tendril. The flowers are nearly always large and showy, the corolla of united petals and usually funnelform, the calyx inferior and of united sepals. The 4 stamens are attached to the corolla tube alternating with the lobes, and there is generally present a fifth sterile stamen. The fruit is a capsule of variable form, or sometimes baccate, and normally very large.

ADENOCALYMNA Mart.

Adenocalymna verrucosum Standl. A large woody vine; leaflets 2, elliptic to oblong, thick, acutish but with obtuse tip, rounded or obtuse at the base, 3-nerved, sparsely stiff-hairy beneath near the base but elsewhere glabrous; flowers of this species not known; young fruit elongated, thick, and densely warty; what is probably the mature fruit of the same species (found upon the ground in the forest) is very long, linear, compressed, and covered with long tubercles.—In wet forest or thickets; known only from this region.

ANEMOPAEGMA Mart.

Anemopaegma macrocarpum Standl. *Coral.* A large woody vine, glabrous or nearly so; leaflets 2, oblong or elliptic-oblong, large, acute or acuminate, acute at the base; flowers not seen; capsule elliptic-oblong, about 11 cm. long and 4 cm. wide, acuminate, glabrous, smooth.—In thickets along the beach near Tela; extending to Panama. The tough stems are used locally, like those of other vines of this family, for tying the framework of native huts.

ARRABIDAEA DC.

Arrabidaea floribunda (HBK.) Loes. A large woody vine; leaflets 2, ovate to oblong, mostly 8–10 cm. long, acute or short-acuminate, rounded at the base, thick, glabrous; flowers in large panicles, purple, the corolla 14–18 mm. long, puberulent; fruit a long linear capsule about 1 cm. wide containing numerous broadly winged seeds.—In wooded swamps near the coast; extending to southern Mexico. Flowers have not been collected in Honduras, and the specific determination is therefore uncertain. Dried specimens of this plant are easily recognized, for, as in many other species of the genus, they turn purplish or bronze when dried. Leaves of some species of *Arrabidaea* are employed in tropical America for dyeing.

CRESCENTIA L.

Crescentia Cujete L. *Jícaro. Calabash tree.* A small tree with short trunk and low dense crown, the branches often long and drooping; leaves simple, clustered on the thick pale branches, oblanceolate to spatulate, long-tapering to the base, acute to rounded at the apex, entire, glabrous or nearly so; flowers solitary or clustered along the trunk and branches, 5–8 cm. long, dark brownish purple, the large calyx irregularly cleft; fruit very variable as to size and shape, oval

and comparatively small or globose and 30 cm. or more in diameter, with a thin hard shell and copious pulp containing many large seeds. —Occasionally planted in this region, and sometimes seen in pastures, but apparently not native; widely distributed in tropical America; on the Pacific slope of Central America frequently forming extensive stands. Called "morro" in some parts of Honduras; "totumo," "totumbo," and "calabazo" in Panama; "guacal," "jícaro de cuchara," and "cutuco" in Salvador. The tree is a curious one because of its flowering and fruiting habits, the flowers being borne chiefly along the trunk and the larger branches. The larger fruits resemble small green pumpkins, and are of such size that one often is amazed that the tree can support such an apparently heavy weight. The dry fruits are in great demand in Central America among the poorer people, who use them for a great variety of purposes. They are fashioned into drinking cups, receptacles for food, vases, spoons, and many other articles. Sometimes the shells are highly ornamented, and the ancient chocolate cups of the Mexicans and other aborigines of Middle America were made from these calabash fruits.

The wood is light or yellowish brown with veins of darker color, moderately hard and heavy, tough and strong, coarse, and fairly easy to work. It is employed for saddletrees, tool handles, ox yokes, and many other articles in which strength is important.

CYDISTA Miers

Cydista diversifolia (HBK.) Miers. A slender woody vine; leaflets 2, ovate to elliptic-oblong, 4–9 cm. long, acute, obtuse to shallowly cordate at the base, glabrous; flowers purple or nearly white, 3–4 cm. long, the corolla with minute scales scattered over the outer surface; capsule linear, very long, compressed, the seeds broadly winged.—In thickets; extending to southern Mexico.

ENALLAGMA Baill.

Enallagma cucurbitina (L.) Baill. *Black calabash.* A large shrub or small tree; leaves simple, obovate, alternate, thick, often 20 cm. long, nearly sessile, rounded and short-pointed at the apex; flowers greenish, about 5 cm. long; fruit globose and resembling a gourd, 8–10 cm. in diameter.—In swamps along the coast; widely distributed in tropical America. Called "tutumito" and "tutumillo" in Panama.

MACFADYENA A. DC.

Macfadyena uncinata (Mey.) DC. *Uña de gato, Chinacla, Coral.* A large slender woody vine; leaflets 2, oblong to lanceolate, long-acuminate, sparsely pubescent or nearly glabrous; terminal leaflet replaced by a tendril composed of 3 slender sharp-pointed hooks resembling the claws of a cat; flowers pale yellow, 6 cm. long, in small axillary clusters; fruit a long linear capsule.—Frequent in thickets; extending to South America. This vine is easy to recognize by its clawlike tendrils. The juvenile plants are quite different in appearance from the adult forms, having leaflets only 1 cm. long and obtuse. They creep closely along tree trunks by numerous small rootlike organs having dilated disklike tips. The stems of the larger vines are employed for tying. The determination of the plant here listed is somewhat uncertain because it was impossible to find it in flower.

PARAGONIA Bur.

Paragonia pyramidata (Rich.) Bur. A large woody vine; leaflets 2, oblong to elliptic, acute, appearing glabrous but usually with minute scales scattered over the lower surface; flowers 6–7.5 cm. long, in ample terminal panicles; calyx bell-shaped, minutely pubescent, scarcely toothed; corolla rose-purple, short-hairy outside; fruit a long linear compressed capsule about 40 cm. long, the seeds broadly winged.—Occasional in thickets; widely distributed in tropical America. Called "bejuco de casa" in Salvador.

PETASTOMA Miers

Petastoma ocositense (Donn. Smith) Kränzl. *Trastraz.* A large woody vine; leaflets 2, oblong, long-acuminate, obtuse at the base, glabrous or nearly so; flowers in few-flowered clusters, the calyx broadly bell-shaped, truncate, bearing a few scattered glands; corolla 8 cm. long, bright purple; fruit a long linear compressed capsule.—Common in wooded swamps about Tela, climbing high on trees; also in Guatemala. The flowers are very conspicuous and handsome, but the blooming season of the vine is a very short one.

TABEBUIA Gómez

The Tabebuias are important timber trees of Mexico and Central America, noted for their remarkably showy and brightly colored blossoms. They have opposite leaves which are long-stalked, and have several large, entire or sometimes toothed leaflets radiating from

the end of the petiole. The large flowers are borne in terminal panicles, cymes, or heads, often when the tree is devoid of leaves. The pendent pods are long and cylindric, containing numerous broadly winged seeds.

Tabebuia Donnell-Smithii Rose. *Cortez.* A tall tree, flowering when leafless; leaflets 5–7, long-stalked, sometimes 25 cm. long, often toothed, when young finely stellate-pubescent but in age nearly glabrous; flowers in large terminal panicles; corolla bright yellow, 5–10 cm. long; capsules 20–30 cm. long or more and 2.5 cm. wide, irregularly ridged and warty.—Frequent in the region of Progreso and probably also about Tela; ranging to Salvador and southern Mexico. Said to be called "San Juan" in some parts of Honduras, and known in Salvador as "cortez blanco." The wood is sometimes exported to the United States from Mexico under the names "primavera" and "white mahogany." It is pale yellowish, moderately hard, easy to work, takes a fine polish, and has a fine feather grain. It is employed for general construction, furniture, and interior trim. The trees are very conspicuous when in flower.

Tabebuia pentaphylla (L.) Hemsl. *Macuelizo.* A large or medium-sized deciduous tree; leaflets usually 5, long-stalked, acute or acuminate, with minute appressed scales scattered over the surface, entire; flowers in few-flowered corymbs, purple or pink, the corolla 7–10 cm. long; pods 20–35 cm. long or larger, compressed, smooth.—Common in forests; widely distributed in tropical America. Called "roble blanco" in some parts of Honduras. In Panama it is known as "roble" and "roble de sabana," in Costa Rica as "guayacán," in Salvador as "maculigua," "maquiligua," "maculís," and "macuilíz," in Guatemala as "mano de león" and "matilishuate."

This is one of the most beautiful trees of Central America, and also one of the most widely distributed and abundant. When in blossom the trees vie in their variety of shades with the famous Japanese cherries, and they exhibit about the same amount of variation in color through the same shades of pink and purple. The trees flower usually about the end of the dry season, and the flowers are produced in such abundance that the trees resemble great bouquets. This species often forms almost pure stands, especially in the drier regions of the Pacific slope.

The wood is moderately hard, straight-grained, easy to work, and light brown with striping of darker brown. It is used for general

construction purposes, and in some parts of Central America it is highly prized for furniture making.

TECOMA Juss.

Tecoma stans (L.) Juss. A shrub or small tree, nearly glabrous; leaves pinnate, the 5–13 leaflets coarsely toothed; flowers bright yellow, 3.5–5 cm. long, in terminal racemes or panicles; pods linear, compressed, 10–20 cm. long, 6 mm. wide.—Occasionally planted for ornament, but apparently not native here; widely distributed in variable forms through much of tropical America. Said to be called "sardinillo" in some parts of Honduras. Called "copete" in Panama; "candelillo," "carboncillo," and "vainilla" in Costa Rica; "chilca" in Nicaragua; "tache," "tasto," "tagualaiste," "San Andrés," and "marchucha" in Salvador. The generic name *Tecoma* is derived from an Aztec word signifying trumpet. The shrub is often planted for ornament in tropical America, being showy because of its large, bright yellow flowers.

PEDALIACEAE. Sesame Family

SESAMUM L.

Sesamum orientale L. *Ajonjolí. Sesame.* An erect hairy annual, the leaves oblong to lanceolate, opposite and alternate, the lowest often lobed or parted; flowers white or pinkish, 2 cm. long, short-pediceled in the leaf axils; corolla 2-lipped; stamens 4; capsule 2-celled, 2 cm. long, containing numerous black or white seeds.—Sometimes grown in gardens; native of the Old World tropics. In Honduras sesame seeds are used medicinally, and also for flavoring candy and other articles of food. In India the sesame, bene, benne, or teel oil extracted from the seeds is used in cooking, and in Europe it is employed in soap manufacture and as an adulterant of olive oil.

GESNERIACEAE. Gesneria Family

This family is a tropical one, consisting of herbs and shrubs with opposite, simple, often toothed leaves. The perfect flowers are often large and very showy, the calyx inferior or united with the ovary, the corolla of united petals, often 2-lipped, and usually with 5 lobes. The fruit is a 1-celled capsule containing numerous small seeds.

BESLERIA L.

Besleria laxiflora Benth. A shrub about a meter high with brittle stems; leaves long-petioled, large, elliptic or ovate, acuminate,

paler beneath, shallowly serrate; flowers arranged in few-flowered short-stalked umbels in the leaf axils; corolla 2.5 cm. long, orange, glabrous.—Frequent in wet forest; ranging to northern South America. Although the flowers are brightly colored, they are not very showy, because usually there are so few of them on a plant.

CODONANTHE Hanst.

Codonanthe calcarata (Miq.) Hanst. A small glabrous epiphytic shrub; leaves thick and fleshy, elliptic or obovate, acute or obtuse, 2.5–5 cm. long, the lateral veins obsolete; corolla white, 3 cm. long, frequently tinged with purple.—On tree trunks or branches in wet mountain forest; ranging southward to northern South America.

COLUMNEA L.

Columnea pilosissima Standl. A small epiphytic shrub, densely hairy almost throughout; leaves somewhat fleshy, lance-oblong, 1.5–3 cm. long, short-petioled; corolla bright red, 2-lipped, 5–6 cm. long, long-hairy outside.—On tree branches in wet forest; known only from this region. The plant is a very showy and handsome one.

Another species of *Columnea* grows in the forest near Lancetilla, but only sterile plants were seen, and its identity is altogether uncertain.

ACANTHACEAE. Acanthus Family

This family is well represented in most parts of tropical America, and in Central America by numerous genera and species. The plants are mostly herbs or shrubs, rarely trees, their stems often conspicuously constricted below the joints when dried. The leaves are opposite, entire or practically so, and without stipules. The perfect flowers are generally irregular and more or less 2-lipped, often large and showy, with an inferior calyx composed of 4 or 5 distinct or united sepals. The 2 or 4 stamens are inserted on the corolla tube alternate with the lobes; the anthers are 2-celled, and often the cells are inserted on the filament at different heights; the cells frequently are appendaged at the base. The fruit is distinctive, being (except in *Mendoncia*) a 2-celled capsule, often contracted and stalked at the base, the few seeds normally attached by a thick hooklike funicle or stalk.

APHELANDRA R. Br.

Aphelandra aurantiaca (Scheidw.) Lindl. *Plate LXI.* An erect herb about 30 cm. high, unbranched, with few pairs of slender-

petioled leaves which are elliptic to oblong or ovate and long-acuminate and glabrous or nearly so; flowers in dense terminal spikes, the bracts large and conspicuous, overlapping, green, about 2.5 cm. long, serrate, finely pubescent, acute; corolla scarlet or orange-scarlet, about 5 cm. long.—Common in wet mountain forest; widely distributed in tropical America. A handsome plant because of its brightly colored flowers, but less showy than some of the shrubby species which occur elsewhere in Central America.

Aphelandra aurantiaca, var. **stenophylla** Standl. Leaves linear or lance-linear, otherwise like the typical form.—Frequently found with the type.

BLECHUM Juss.

Blechum pyramidatum (Lam.) Urban. An erect or decumbent herb, the stems sparsely pubescent; leaves slender-petioled, ovate or oblong, usually acute, glabrous or nearly so; flowers in dense spikes at the ends of the branches, the large green bracts (about 1 cm. long) broadly ovate, appressed-pubescent, acute, entire; corolla pale purple, about as long as the bracts; stamens 4.—A weed in wet thickets and waste ground; not common here, but one of the most abundant and widely distributed weeds of tropical America generally. Called "brinca-brinca" in Panama, and known in Salvador as "cuchansayo," "corredora," and "correflusión."

DIATEINACANTHUS Lindau

Diateinacanthus hondurensis Lindau. *Plate LXII.* A slender shrub 1.5–3 meters high, glabrous or nearly so; leaves thin, short-petioled, lance-oblong, long-acuminate; flowers in large lax many-flowered terminal panicles, slender-pediceled; corolla pale yellow, tubular, 1.5 cm. long.—Frequent in wet forest; occurring also in British Honduras. The genus consists of a single species, which was described from material collected near Tela in 1903 by Percy Wilson.

HYGROPHILA R. Br.

Hygrophila conferta Nees. An erect branched herb 30–60 cm. high, glabrous or nearly so, the lower joints usually rooting; leaves petioled, linear to narrowly lanceolate, long-acuminate; flowers white, scarcely 1 cm. long, densely clustered in the leaf axils; stamens 4; corolla conspicuously 2-lipped.—Common along small streams, often growing in shallow water; widely distributed in tropical America. Called "flor de garza" in Panama.

JACOBINIA Moric.

The Jacobinias are shrubs or herbs with showy, red or yellow flowers arranged in cymes, spikes, or panicles and often subtended by large green bracts. The corolla is conspicuously 2-lipped, the calyx 5-lobed. The 2 stamens have unequal anther cells which are not appendaged at the base. The small capsule is normally 4-seeded.

Jacobinia spicigera (Schlecht.) L. H. Bailey. *Cuajatinta, Añile.* A densely branched shrub 2 meters high, minutely pubescent or nearly glabrous; leaves short-petioled, lance-oblong to ovate, 6–15 cm. long, acuminate, nearly glabrous; flowers in few-flowered, axillary and terminal cymes, the red corolla 3–3.5 cm. long.—Cultivated at Progreso; native of Mexico but often planted in Central America. Known in Salvador as "sacatinta" and "tinta," and in Mexico as "hierba azul," "micle," or "muicle." About almost any dwelling in Central America one will find a shrub or two of this species, whose leaves are employed generally, like indigo, for whitening clothes, a use that probably antedates the conquest. If the leaves are macerated in hot water, the infusion soon turns dark blue, and if this liquid is added to water in which clothes are rinsed, it whitens them in the same manner as the more usual indigo. The plant was employed formerly as a dye, and it still finds employment in domestic medicine.

Jacobinia umbrosa (Benth.) Blake. *Plate LXIII.* An herb or shrub usually about 1 meter high, simple or sparsely branched; leaves large, petioled, broadly ovate or elliptic, glabrous or nearly so; flowers in large, very dense, spikelike panicles with large green bracts; corolla bright yellow, 5–7 cm. long.—Frequent in wet thickets or in forest; extending to Mexico. Called "cola de ardilla" in Salvador. The plant is a handsome and very showy one.

JUSTICIA L.

The Justicias are rather numerous in Central America, but the majority of them are weedy or small herbs of inconspicuous aspect and of little or no importance. They are usually herbs but sometimes shrubs, with mostly small, cymose, racemose, or panicled flowers. The corolla is conspicuously 2-lipped, and there are two stamens. The bracts are commonly small and inconspicuous.

Justicia comata (L.) Lam. A perennial herb, the stems 1 meter long or less, usually rooting at the lower joints, glabrous or nearly so throughout; leaves sessile or short-petioled, ovate to lance-oblong, long-acuminate; flowers small, in lax panicles, the branches opposite

or whorled; corolla white with purple dots, 5 mm. long.—Common in wet soil, in thickets, or especially in mud about small pools; widely dispersed in tropical America.

Justicia pectoralis Jacq. A slender herb about 1 meter long, frequently spreading and rooting at the nodes, glabrous or nearly so; similar to *J. comata*, but the panicle branches forking; corolla 8 mm. long, bright rose-purple.—Frequent in wet thickets and marshy fields; widely distributed in tropical America. Called "curía" in Panama.

Justicia trichotoma Kuntze. A bushy herb about a meter high, the slender branches densely pubescent; leaves slender-petioled, elliptic to oblong, acute or acuminate, glabrous; flowers few, in small cymes, the corolla 1 cm. long, white tinged with purple or sometimes greenish yellow.—Occasional in wet forest and thickets; extending to Panama and perhaps farther south.

MENDONCIA Vell.

Mendoncia costaricensis Oerst. A large herbaceous vine climbing high on trees; leaves long-petioled, oblong or elliptic-oblong, abruptly acuminate, nearly glabrous; flowers solitary in the leaf axils, long-stalked, subtended by 2 large green bracts; corolla 5 cm. long, white, the throat pale green and purplish; fruit a plumlike black drupe about 2 cm. long.—In wet thickets, infrequent; extending to Costa Rica.

ODONTONEMA Nees

Odontonema cuspidatum (Nees) Kuntze. A shrub 1–2 meters high, simple or with few branches, nearly glabrous; leaves large, short-petioled, oblong or lance-oblong, long-acuminate, long-tapering to the base; flowers in long spikelike terminal racemes; corolla bright red, 2.5 cm. long, narrow, scarcely 2-lipped; stamens 2.—Occasional in wet thickets; extending to Mexico. A rather conspicuous plant because of the vividly colored flowers.

THUNBERGIA Retz

The Thunbergias are all natives of the Old World, but they are often planted for ornament because of their showy flowers, and some species have become naturalized in America. They are usually vines with solitary or racemose, commonly large and brightly colored flowers having 4 stamens. The fruit is a 2–4-seeded capsule.

Thunbergia alata Boj. A small herbaceous vine, finely and rather sparsely pubescent; leaves broadly hastate-ovate, acute or

obtuse, the petioles conspicuously winged; corolla about 4 cm. broad, buff with a maroon eye.—A native of Africa; cultivated about Tela and also thoroughly established along roadsides and in wet fields. Known in Costa Rica by the name "ojo de poeta."

Thunbergia alata, var. **alba** Paxt. Like the species, but the corolla white.—Naturalized in wet thickets about Progreso.

Thunbergia erecta Andr. A shrub 1–2 meters high, erect, nearly glabrous; leaves small, petioled, ovate to lance-oblong, often undulate, paler beneath; corolla about 7 cm. long, royal purple.—Native of Africa, but planted commonly for ornament in Central America, as it is in the Tela region. Called "cuerno" and "Nazaret" in Salvador. Forms with white flowers are sometimes seen in cultivation.

Thunbergia fragrans Roxb. A large herbaceous vine; leaves appressed-hairy, oblong to triangular, truncate at the base and often with short lobes; petioles not winged; corolla about 5 cm. broad, white. —A native of India, sometimes grown here and elsewhere in Central America for ornament.

Thunbergia grandiflora Roxb. A large herbaceous vine; leaves large, oblong to ovate, cordate at the base, often remotely and coarsely toothed, thick, nearly glabrous; flowers in racemes, about 6 cm. long, violet.—A very showy plant, native of the East Indies, planted here as well as in other parts of Central America for ornament. Called "Emperatriz Eugenia" in Salvador.

RUBIACEAE. Madder Family

The family is one of the largest in Central America, and its members usually are easy to recognize because of the combination of opposite leaves with stipules, corolla of united petals, and inferior ovary. The leaves in our species are entire. The fruit may be either dry or fleshy, and contains one, two, or many seeds. To this group belong the species of *Cinchona,* from which quinine is obtained. The quinine trees are natives of South America, but some of them have been introduced into cultivation in the mountains of Central America.

OLDENLANDIA L.

Oldenlandia corymbosa L. A slender glabrous annual, the stems erect or procumbent; leaves linear or nearly so; flowers minute, white, in stalked few-flowered umbels in the leaf axils; fruit a small capsule containing numerous seeds.—Frequent in thickets along the

beach at Tela; sometimes found as a weed in moist fields; an inconspicuous weedy plant, widely distributed in tropical America.

RONDELETIA L.

The Rondeletias are shrubs or small trees. The species of the Lancetilla region have small and rather inconspicuous flowers arranged in long spikelike panicles. The corolla has a slender tube and short spreading lobes. The fruit is a small capsule containing numerous seeds. Other species besides those listed here are known from Honduras.

Rondeletia buddleoides Benth. A slender tree 6–9 meters high; leaves short-stalked, oblong-elliptic, long-acuminate, green and nearly or quite glabrous on the upper surface, covered beneath with a dense white tomentum; flowers very small, pale pink.—Frequent in wet hill forests; widely distributed in Central America, especially in the mountains; occurring in the mountains of the interior of Honduras as well as here near the coast.

Rondeletia gracilis Hemsl. A slender shrub or tree 3–7.5 meters high; leaves oblong-elliptic, long-acuminate, long-tapering at the base, green and glabrous above, green beneath and when young with a sparse cobwebby pubescence but soon nearly glabrous; flowers dull red, about 8 mm. long; capsules about 2 mm. long.—Frequent in wet forest; known also from Guatemala.

Rondeletia stachyoidea Donn. Smith. A slender shrub or tree 2–6 meters high; leaves lanceolate or narrowly lanceolate, with very long and narrow tips, long-tapering at the base, green and nearly glabrous on the upper surface, beneath green but covered with long silky hairs; corolla 1 cm. long.—In wooded swamps near the coast, infrequent; ranging from Guatemala to Costa Rica.

HILLIA Jacq.

Hillia tetrandra Sw. A glabrous shrub 1 meter high or smaller, growing as an epiphyte on the branches of tall forest trees; leaves nearly sessile, oblong or obovate, obtuse or rounded at the tip, thick and fleshy; flowers solitary at the ends of the branches, the corolla white, 3–8 cm. long; fruit a slender capsule 5–7 cm. long, containing numerous seeds, each bearing a tuft of brownish hairs.—Occasional in the upland forests; not found in flower during the winter; ranging in Central America from Guatemala to Costa Rica, but seldom collected.

CALYCOPHYLLUM DC.

Calycophyllum candidissimum (Vahl) DC. *Salamo.* A tree 15 meters high or more; leaves elliptic or ovate, long-petioled, nearly glabrous; flowers in dense terminal corymblike panicles; one lobe of the calyx in some of the flowers expanded into a large white petal-like limb; fruit a small capsule.—Collected near Progreso; widely dispersed in tropical America. Known in Panama by the names "harino," "alazano," and "madroño." The wood is heavy, strong, and very fine-grained. It is used in Central America for various purposes, especially for making fine-toothed combs. The tree is a very beautiful one when in flower, presenting an almost solid mass of white, which keeps its color for many weeks.

UNCARIA Schreb.

Uncaria tomentosa (Willd.) DC. *Uña de guara* ("macaw's claw"). A large woody vine armed with stout hooked spines; leaves oval or ovate, acute, green and shining on the upper surface, paler beneath and when young tomentose but in age nearly glabrous; flowers small, creamy white, fragrant, arranged in very dense, spherical heads; fruit dry and nutlike.—Common in wooded swamps near the coast; occurring also in Guatemala and ranging southward into South America. The plant is closely related to the button-bush (*Cephalanthus*) of the United States, and the flower heads are very similar to those of the latter shrub. One species of button-bush (*Cephalanthus salicifolius* H. & B.) grows in the mountains of the interior of Honduras.

HOFFMANNIA Sw.

The plants are shrubs or herbs, usually with small and inconspicuous flowers. The fruit is a small fleshy berry containing numerous minute seeds. Many species of the genus are known from Central America, but most of them are of narrowly limited range.

Hoffmannia hondurensis Standl. A slender shrub 1–2 meters high, nearly glabrous; leaves oblong-elliptic or oblanceolate-oblong, acuminate, long-tapering to the base; stems green; flowers small, borne in small short-stalked clusters in the axils of the leaves; berries white, about 5 mm. long.—Rather frequent in wet mountain forest; known only from this region.

Hoffmannia refulgens (Hook.) Hemsl. A low simple-stemmed herb about 30 cm. high; leaves large, short-stalked, oblanceolate-oblong, acute, rather fleshy, tapering to the base, brownish-hairy

beneath along the veins; flowers small, pale red, in long-stalked clusters in the leaf axils; fruit a small, bright red berry.—Occasional in wet mountain forest, usually on banks in deep shade; widely distributed in Central America and southern Mexico, but of rather rare occurrence.

PENTAGONIA Benth.

Pentagonia Donnell-Smithii Standl. A shrub or tree 3–9 meters high with few thick branches, or often unbranched; leaves very large, often 60 cm. long or more, broadly obovate, acute, short-stalked, thick, when dry with very fine and close lines or striolations between the main veins; flowers large, reddish, clustered in the leaf axils; fruit globose, about 2 cm. in diameter, with a thick rind, containing numerous coarse seeds.—Common in wet mountain forest; ranging southward to Costa Rica. The tree is conspicuous because of the exceptionally large leaves, which have a characteristic venation not found in any other plant of the region.

COCCOCYPSELUM P. Br.

Coccocypselum herbaceum Lam. A creeping herb, the stems rooting at the joints; leaves slender-stalked, ovate or oblong, obtuse or acutish, sparsely and finely pubescent; flowers small, in clusters of 2 or 3 in the leaf axils; fruit a vivid blue, juicy berry about 6 mm. in diameter.—In a wooded swamp near Triunfo; widely distributed in tropical America. The plant is a somewhat conspicuous and rather handsome one because of its attractively colored fruits.

SABICEA Aubl.

Sabicea villosa R. & S. A coarse vine, either glabrous or somewhat woody toward the base, the stems often reddish and usually coarsely hairy; leaves short-stalked, ovate or oblong, acuminate, thin, sparsely hairy, green; flowers small, greenish yellow, in small dense clusters in the leaf axils; fruit a small fleshy purple-black berry containing numerous seeds.—A common weedy plant of wet thickets, of inconspicuous appearance; ranging all along the Atlantic coast of Central America, and even more widely distributed.

HAMELIA Jacq.

Shrubs or small trees; leaves opposite or whorled, slender-stalked, large or small, usually elliptic or ovate and acute or acuminate; flowers in usually one-sided spikes or racemes, these forming stalked

cymes at the ends of the branches; fruit a juicy berry containing numerous small seeds.

Hamelia longipes Standl. *Coloradillo.* A slender glabrous shrub or tree 3–6 meters high; leaves large, opposite; petioles and branches usually tinged with red; flowers slender-pediceled, the corolla red, tubular, 1.5 cm. long, glabrous; berries about 6 mm. long, at first red, becoming black at maturity.—Frequent in wet mountain forest; occurring also in Guatemala.

Hamelia patens Jacq. *Coloradillo.* A shrub 1.5–3 meters high; leaves mostly in 3's, finely pubescent beneath; corolla about 2 cm. long, tubular, orange-red, minutely pubescent; berries oblong, 6–8 mm. long, purplish black when ripe.—Common in wet thickets at lower elevations; widely distributed through the lowlands of Central America, and in tropical America generally; extending northward to Florida. Called "uvero" in Panama; "zorrillo," "zorrillo real," "palo camarón," and "añileto" in Costa Rica; "flor de cangrejo" in Guatemala; "chichipince" in Salvador and some parts of Honduras; "coralillo" in Salvador; and the name "coral" is reported from Honduras. The fruits are edible but not of very agreeable flavor, and they are seldom eaten.

Hamelia Rovirosae Wernham. *Coloradillo.* A densely branched shrub 1–3 meters high; leaves mostly in 3's, small, pubescent beneath; corolla dull red or orange-red, nearly 3 cm. long, rather copiously long-hairy; fruit purple-black.—Frequent in wet thickets at lower altitudes; ranging from Nicaragua to southern Mexico. The species is easily recognized by the well-developed narrow green calyx lobes, those of the other two species being minute.

POSOQUERIA Aubl.

Posoqueria latifolia (Rudge) R. & S. *Cachito.* A large glabrous shrub or a small tree; leaves short-petioled, large, leathery, oval or oblong, obtuse or acute; stipules large and broad, green; flowers white, in dense terminal corymbs, the corolla tube very slender and 12–16 cm. long, the oblong lobes spreading; fruit fleshy, juicy, yellow, globose, resembling a small orange, containing numerous large seeds.—Occasional in thickets and wooded swamps; common along the Atlantic coast of Central America, and widely dispersed in tropical America. Called in Panama "borajó," "boca vieja," "fruta de mono," and "fruta de murciélago"; in Costa Rica "guayaba de mico." The long slender flowers are very showy.

GENIPA L.

Genipa caruto HBK. *Jagua. Genipap.* A large or medium-sized tree; leaves large, obovate or oblong-obovate, short-acuminate, short-stalked, gradually narrowed to the base, finely and densely pubescent beneath; flowers yellowish white, 2–4.5 cm. long, in cymes at the ends of the stout branches; fruit globose, 5–7 cm. in diameter or larger, the thick rind rough and brownish, the pulp full of large, flat, closely packed seeds.—In wet forest or in clearings, not common here; abundant in many parts of Central America. The name "jagua" is used in most parts of Central America, but in Salvador the tree is called "irayol." The fruit is edible, but it is rarely eaten in Central America. Its juice produces upon cloth and other objects a blackish or brownish indelible stain, and it was formerly much used by the aborigines for dyeing and especially for painting the body, to make it attractive and for protection against the bites of insects. The wood is dull brownish gray, sometimes with a pinkish or yellowish tinge, hard and heavy, with rather straight or irregular grain, of rather fine texture, strong, and tough. It is highly esteemed for construction purposes and for objects in which elasticity and strength are important. On the coast of Honduras it is employed for making ax handles.

ALIBERTIA A. Rich.

Alibertia edulis (L. Rich.) A. Rich. *Lirio.* A dense glabrous shrub 2–4.5 meters high; leaves short-stalked, oblong to ovate, sharp-pointed, thick and stiff, shining, rounded at the base; flowers clustered at the ends of the branches, those of the two sexes on separate plants; corolla white, about 2.5 cm. long; fruit globose, 2.5 cm. broad, yellowish at maturity, fleshy, containing numerous seeds.—Frequent in thickets along the beach at Tela; widely distributed in Central America. Known in Panama as "lagartillo," "trompo," "trompito," and "madroño"; in Salvador as "torolillo"; and in Guatemala as "guayaba de monte." The Barbadians of the Canal Zone call the plant "wild guava." The fruit is reported to be edible, but it is not at all attractive. In Panama boys often use the hard green fruits, with a stick thrust through them, as tops.

RANDIA L.

Randia armata (Sw.) DC. *Cagalero, Crucetilla.* A shrub 1–2.5 meters high, armed with numerous stout sharp spines, these mostly in 4's at the ends of the spurlike branchlets; leaves thin, short-stalked,

elliptic or obovate, abruptly pointed, finely pubescent beneath or nearly glabrous; flowers rather large, greenish white, sweet-scented, with a slender tube and broad spreading lobes; fruit globose, 2.5–3.5 cm. long, containing black pulp and numerous large seeds.—In thickets along the beach at Tela, and also at Progreso; widely distributed in tropical America, and common in many parts of Central America. The name "rosetillo," used also in Panama and Guatemala, is reported from Honduras. In Salvador the shrub is called "jicarillo" and "torolillo." The pulp of the fruit is edible but of most unappetizing appearance, and not at all agreeable in flavor.

GUETTARDA L.

Guettarda macrosperma Donn. Smith. A shrub or a small tree, sometimes 6 meters high, with dense rounded crown; leaves thin, slender-stalked, oval or elliptic, acute, with closely appressed, silky hairs especially on the lower face; flowers in few-flowered stalked cymes in the leaf axils, sessile along the branches of the cyme, the corolla white, 1.5 cm. long, silky-pubescent; fruits small, globose, containing a single 3–4-celled stone.—Occasional in thickets and pastures toward the coast; collected also at Siguatepeque; the species ranges from Guatemala to Costa Rica.

CHIOCOCCA P. Br.

Chiococca alba (L.) Hitchc. A slender shrub 1.5–2 meters high, the long branches pendent or recurved, sometimes clambering over other shrubs; leaves stalked, ovate or elliptic, small, glabrous, shining; flowers small, white, inconspicuous, in short panicles in the leaf axils; fruit round, 4–8 mm. in diameter, flattened, consisting of 2 one-seeded carpels with a fleshy white coating.—In thickets along the beach at Tela; widely distributed in tropical America, and frequent in many parts of Central America. Called "lágrimas de María" in Panama and "lágrimas de San Pedro" in Salvador. The shrub extends northward into Florida.

IXORA L.

Ixora coccinea L. A low dense shrub; leaves small, usually cordate at the base, sessile; flowers bright red, in dense terminal clusters, the corolla with a long slender tube.—Sometimes planted for ornament; native of the East Indies. Called "buquet de novia" in Panama.

COFFEA L.

Coffea arabica L. *Café. Coffee.* Coffee, a native of tropical Africa, is planted extensively in the mountains of the interior of Honduras, although the crop of this country is much smaller than that of the other republics of Central America. Coffee is the most important agricultural crop for the greater part of the population of Central America, but the industry has not yet attained its fullest possible development in Honduras. The shrub is planted about some of the houses in the region of Lancetilla, and there is more of it in the neighborhood of Progreso. Plants are sometimes found in woodlands, to which the seeds probably have been carried by birds. Such half-wild individuals were noted in a swamp near Tela, and again in thickets about Progreso.

GEOPHILA Don

Geophila herbacea (L.) Schum. *Yerba de culebra.* A creeping herb, rooting at the nodes; leaves long-stalked, heart-shaped, acute to rounded at the apex, nearly glabrous; flowers small, white, in stalked clusters in the axils of the leaves; fruit small, juicy, bright red, containing 2 one-seeded stones.—In wet thickets or forest, common; often a weed in banana plantations; frequent in many parts of Central America. The local name is given "because snakes eat the berries."

RUDGEA Salisb.

Rudgea ceratopetala Donn. Smith. A glabrous shrub or small tree 2.5–6 meters high; leaves practically sessile, elliptic, oblong, or ovate, acuminate, narrowed to the base; flowers small, white, in stalked few-flowered cymes at the ends of the branches; calyx truncate or obscurely toothed; fruit globose, green, over 1 cm. in diameter, containing 2 one-seeded stones.—Common in wet mountain forest; ranging northward to southern Mexico. The stipules are distinctive in this genus, being short and fringed with fleshy appendages or teeth, otherwise the shrubs resemble the species of *Psychotria.*

CEPHAELIS Sw.

The plants of this genus are closely related to the Psychotrias, but may be distinguished by the fact that their flowers are arranged in dense heads, which are surrounded by an involucre of large leaflike bracts.

Cephaelis glomerulata Donn. Smith. A glabrous shrub about 1.5 meters high; leaves oblong, acuminate, short-stalked; flower heads solitary and sessile at the ends of the branches, nearly 3 cm. broad, the wide bracts greenish white; corollas white.—Found only in a wooded swamp near Triunfo; ranging to British Honduras.

Cephaelis tomentosa (Aubl.) Vahl. A shrub 1–2 meters high, very hairy throughout; leaves slender-stalked, oblong-elliptic, long-acuminate; flower heads large, long-stalked, subtended by 2 large, broad, bright red bracts; corollas yellowish; fruit prussian blue, small, juicy, containing 2 one-seeded stones.—Growing in a wooded swamp near Triunfo; a common plant of the lowlands along the Atlantic coast of Central America. The shrub always attracts attention because of the large flower heads with their showy, bright-colored bracts.

PSYCHOTRIA L.

This, the largest genus of the family, is generously represented in tropical America. Many species occur in the forests of Central America, most of them rather local or limited in their distribution. Although without economic importance, the Psychotrias are of interest to the botanist because of their great variety. *Psychotria emetica* L. f., which grows farther southward in Central America, where it is called "raicilla," yields a kind of ipecac. A part of the ipecac of commerce is obtained from a species of the preceding genus, *Cephaelis Ipecacuanha* (Brot.) Rich., which ranges from Nicaragua to Brazil. In Panama it, also, is known under the name "raicilla."

The Psychotrias are shrubs or small trees, usually with green stems; the stipules are either green and persistent or brownish and quickly deciduous. The small flowers are usually whitish or greenish and inconspicuous; they are variously arranged and borne at the ends of the branches or rarely in the axils of the leaves. The fruits are small and fleshy, containing 2 one-seeded stones which often are ribbed on the back.

Psychotria brachiata Sw. A densely branched shrub 1.5–2 meters high; leaves short-stalked, obovate or obovate-oblong, acuminate, gradually narrowed to the base, glabrous or nearly so; inflorescence a narrow terminal panicle, the flowers sessile, subtended by small but conspicuous green bracts which persist in fruit; fruits small, deep prussian blue.—In wet mountain forest, rare; widely distributed in tropical America.

Psychotria chiapensis Standl. A shrub or small tree 3–6 meters high, glabrous or nearly so; leaves short-stalked, elliptic-oblong, short-acuminate, acute at the base; flowers in dense terminal cymes, subtended by broad bracts which are rounded at the apex; corolla white, about 1.5 cm. long; fruits globose, green, about 1.5 cm. long, the 2 stones with 3 large ribs on the back.—In wet forest on the hills above Lancetilla; ranging from southern Mexico to Panama.

Psychotria crebrinervia Standl. A slender shrub or tree 3–4.5 meters high; leaves large, short-stalked, lanceolate to oblong-elliptic, long-acuminate, thin, acute at the base, nearly glabrous; flowers small, very numerous, in large stalked panicles at the ends of the branches; fruits globose, black, about 3 mm. long.—Frequent in wet forest; occurring also on the Atlantic slope of Guatemala and in British Honduras.

Psychotria cuspidata Bredem. A slender glabrous shrub about a meter high; stipules green and persisting; leaves short-stalked, elliptic or ovate, abruptly cuspidate-acuminate, acute at the base; panicles terminal, small, about 2 cm. long and somewhat broader, many-flowered, the branches usually pubescent; corolla white, 4 mm. long; fruit constricted vertically at the middle, yellow turning black, about 3 mm. long.—Collected only near Triunfo, in a wooded swamp; widely distributed in tropical America.

Psychotria graciliflora Benth. A slender dense shrub about a meter high; stipules brownish, quickly deciduous; leaves small, obovate-oblong, abruptly acuminate, gradually narrowed to the base, thin, dark green, glabrous; flowers small, pale yellow, in small slender-stalked panicles at the ends of the branches; corolla about 3 mm. long; fruit globose, conspicuously ribbed, bright red, about 3 mm. long.—Frequent in wet thickets or wooded swamps; extending southward to Panama.

Psychotria granadensis Benth. A dense shrub about a meter high; stipules brownish, quickly deciduous; leaves short-stalked, obovate or obovate-oblong, long-acuminate, long-tapering to the base, glabrous or nearly so; flowers small, greenish white, in broad dense panicles which are sessile at the ends of the branches; fruit small, bright red.—Common in thickets along the beach; widely distributed in Central America. Originally described from Granada, Nicaragua, hence the specific name.

Psychotria grandis Sw. A tree 4.5–6 meters high, glabrous nearly throughout; stipules large, green, ovate, persistent; leaves large, short-stalked, usually oblong-obovate or oblong-elliptic, acute, gradually narrowed to the base; flowers small, whitish, in large broad long-stalked panicles; fruits globose, 6 mm. in diameter, red.—Frequent in wet thickets or mountain forest; widely distributed along the Atlantic coast of Central America.

Psychotria limonensis Krause. A glabrous shrub 2–3 meters high; stipules brown, early deciduous; leaves large, stalked, broadly elliptic to oblong-elliptic, acute at each end; flowers very numerous, small, whitish, in broad sessile panicles at the ends of the branches; fruits about 4 mm. long, conspicuously ribbed, turning green and finally red.—Common in thickets and mountain forest; ranging from Guatemala to Panama, along the Atlantic coast.

Psychotria macrophylla R. & P. A simple-stemmed shrub about a meter high, glabrous or nearly so; leaves large, lance-oblong, petioled, long-acuminate; flowers greenish white, small, arranged in small stalked panicles inserted in the axils of the leaves; fruits small, white when fully ripe.—Collected in wet forest above Lancetilla, but rare here; widely distributed in the forests of Central America, and ranging far southward in South America.

Psychotria marginata Sw. *Plate LXIV.* A slender shrub 1.5–2.5 meters high, glabrous; stipules brownish, early deciduous; leaves obovate-oblong to oblanceolate, acuminate, long-attenuate to the base, petioled; flowers about 4 mm. long, pediceled, arranged in lax many-flowered slender-stalked panicles at the ends of the branches, the corolla pale greenish yellow; fruits globose, cherry-red, conspicuously ribbed, 3 mm. long.—Common in wet forest; one of the most common *Psychotria* species of Central America.

Psychotria Oerstediana Standl. A nearly glabrous shrub 1–2.5 meters high, usually with dense foliage; stipules brownish, soon deciduous; leaves thick, mostly obovate, abruptly short-pointed, acute at the base; flowers small, white, in small dense panicles which are sessile at the ends of the branches; fruits 6 mm. long, conspicuously ribbed, bright red.—Common in thickets near the beach; ranging northward to Mexico. The flowers are fragrant.

Psychotria patens Sw. A slender glabrous shrub 1.5–2.5 meters high; stipules small, awl-shaped, green, persisting; leaves lanceolate or lance-oblong, long-acuminate, short-stalked, acute or obtuse at the base; flowers very small, whitish, in slender-stalked narrow

panicles at the ends of the branches, the panicle branches purple; fruits scarcely 3 mm. long, deep or pale blue.—Common in wet forest; a widespread species in Central America. Called "garricillo" in Panama.

Psychotria pubescens Sw. A shrub 1.5–2.5 meters high; stipules small, green, 2-awned, persisting; leaves thin, petioled, elliptic-oblong, long-acuminate, glabrous or nearly so; flowers small, greenish white or pale yellow, in small stalked panicles at the ends of the branches; fruits purplish black, 4–5 mm. in diameter.—Noted only in a wet thicket near Triunfo; common in many parts of Central America.

Psychotria simiarum Standl. A shrub or small tree, sometimes 7.5 meters high, the slender green branches glabrous; stipules green, persisting, very small, 2-dentate; leaves glabrous, mostly elliptic or oblong-elliptic, long-acuminate, acute at the base; flowers very small, greenish cream, in small stalked panicles at the ends of the branches; fruit blue at maturity.—In dense wet mountain forest; described from this region and occurring also in Guatemala.

Psychotria uliginosa Sw. A simple-stemmed glabrous shrub 1.5 meters high or less; leaves very large, thick and somewhat fleshy, very brittle when fresh, oblong, abruptly short-pointed, narrowed to the base, pale beneath; flowers in long-stalked few-flowered panicles inserted in the axils of the leaves; fruits globose, 8 mm. in diameter, bright red, the 2 stones coarsely ridged on the back.—Frequent in wet forest near the tops of the hills above Lancetilla; widely distributed along the Atlantic coast of Central America. The plants are handsome and rather showy when in fruit.

PALICOUREA Aubl.

Shrubs or small trees, similar in general appearance to the Psychotrias. The corolla in *Palicourea* is enlarged at the base of the tube, and the tube is often somewhat curved; in *Psychotria* the tube is straight and not enlarged at the base.

Palicourea crocea (Sw.) R. & S. A slender glabrous shrub 1.5–2.5 meters high; stipules short, persisting, with 2 awl-shaped lobes rising from the truncate top; leaves lanceolate to oblong-elliptic, acuminate, acute at the base, drying yellowish green; flowers about 1 cm. long, in long-stalked panicles at the ends of the branches, the corolla tubular, red; branches of the panicle deep red; fruit 5 mm. long, black, shining, juicy, containing 2 one-seeded stones.—

In wet thickets and swamps near the coast; widely distributed in Central America.

Palicourea guianensis Aubl. A slender shrub 3–4.5 meters high; stipules large, persisting, 2-lobed; leaves large, usually over 12 cm. broad, elliptic, acute, glabrous; flowers yellow, in rather large, stalked panicles at the ends of the branches; fruit 4–5 mm. long, purplish black; branches of the panicle wine-red.—In wet thickets near Tela; frequent along the Atlantic coast of Central America. The leaves are several times as large as those of *P. crocea.*

FARAMEA Aubl.

Shrubs or small trees, glabrous throughout; stipules green and often persisting, with a bristlelike tip; leaves short-stalked, opposite; flowers in terminal panicles or corymbs; fruit globose, somewhat fleshy, containing a single large seed.

Faramea occidentalis (L.) Rich. A slender shrub 3 meters high; leaves mostly elliptic-oblong, abruptly short-pointed, acute at the base, usually somewhat leathery; flowers white, in few-flowered corymbs; fruit depressed-globose, about 8 mm. broad, often tubercled.—In a wooded swamp near Triunfo; a rather common shrub of Central America. Called "huesito" in Panama and "cafecillo" in Salvador.

Faramea stenura Standl. *Plate LXV.* A glabrous shrub or small tree 2.5–6 meters high with slender green branchlets; leaves very shortly stalked, narrowly oblong, abruptly contracted at the apex and terminating in a long linear tip; flowers nearly 2 cm. long, in large dense corymbs, the corolla bright blue, the calyx whitish; fruit about 1.5 cm. broad and 1 cm. high, green or probably black when fully ripe.—Common in the wet mountain forest; known only from the hills about Lancetilla. The blue flowers are rather handsome, and draw one's attention because of their rare color.

MORINDA L.

Morinda panamensis Standl. *Concha de huevo.* A glabrous shrub or tree 3–6 meters high; leaves opposite, short-stalked, elliptic to oblong, acute or acuminate, narrowed to the base; flowers small, white, fragrant, borne in small, very dense, few-flowered, stalked heads clustered at the ends of the branches; flower head becoming fleshy and yellow in fruit.—In wet thickets and swamps about Tela; ranging from Panama to Guatemala. The fruits of some species of this genus are edible.

MITRACARPUS Zucc.

Mitracarpus hirtus (L.) DC. A slender erect annual, the stems and leaves finely pubescent; leaves oblong-lanceolate, acute, thin, sessile or nearly so; flowers minute, white, in dense headlike clusters in the leaf axils and at the ends of the few branches; fruit a small capsule, opening by a lid, containing one seed in each of the 2 cells.—A frequent weed in thickets and in cultivated ground; widely distributed in tropical America.

RICHARDIA L.

Richardia scabra L. A much-branched prostrate annual, densely hairy throughout; leaves elliptic-oblong, small, contracted into a short margined petiole, acute or obtuse; flowers small, white, clustered in large dense heads at the ends of the branches, each head subtended by several large leaflike bracts; fruit consisting of 3 or 4 one-seeded carpels which are roughened and which separate at maturity without opening.—A common weed along the beach at Tela; collected also at Progreso, and abundant there; one of the generally distributed weeds of Central America.

DIODIA L.

Small, chiefly weedy herbs; stipules bearing long bristles; flowers small, white, solitary or clustered in the leaf axils.

Diodia maritima Thonn. A prostrate herb, the creeping stems 1 meter long or less, forming rather dense mats; leaves oblong, glabrous, acute or acuminate.—Along the seashore, growing over the sand, infrequent; widely distributed in tropical regions.

Diodia sarmentosa Sw. A slender herb, the stems often 1–2 meters long, either prostrate or clambering over other plants; leaves oblong or lanceolate, finely pubescent, acuminate, conspicuously veined; flowers minute, white, in few-flowered sessile clusters in the leaf axils; fruit dry, 2-celled, the 2 one-seeded carpels separating at maturity but remaining closed.—In wooded swamps and in thickets along the beach near Tela; widely distributed in tropical America, but rather rare, so far as available specimens indicate, along the Atlantic coast of Central America. One or more additional species of *Diodia* grow in the grasslands of the interior of Honduras.

HEMIDIODIA Schum.

Hemidiodia ocimifolia (Willd.) Schum. A simple or branched herb, usually erect but the stems sometimes elongated and clamber-

ing over other plants, rounded, not angled; leaves lanceolate, long-acuminate, glabrous or nearly so, conspicuously veined, narrowed at the base into a short petiole; flowers minute, white, clustered in the leaf axils; fruits small, dry, 2-celled, the carpels 1-seeded, when fully ripe opening only near the base.—A common weed in thickets and waste ground; generally distributed in Central America. The genus consists of a single species.

SPERMACOCE L.

Spermacoce glabra Michx. A glabrous erect herb 30–60 cm. high, sparsely branched, turning blackish when dried; leaves mostly lanceolate, acuminate, narrowed into the petiole; flowers minute, white, in few-flowered sessile clusters in the leaf axils; fruit small, dry, consisting of 2 cells or carpels, these separating at maturity, one of them opening and the other remaining closed.—Occasional in wet thickets; widely distributed in tropical America but not common in Central America. The plant extends northward into the southeastern United States.

BORRERIA Meyer

The Borrerias are unimportant and inconspicuous weedy herbs, either annual or perennial; their mostly narrow leaves are nearly sessile or contracted toward the base into a short petiole. The minute white flowers are crowded in dense clusters in the leaf axils and at the ends of the branches. The small dry fruits consist of 2 one-seeded carpels, which separate at maturity, and both of them open near the apex. One or more additional species of the genus are found in the mountains of the interior of Honduras.

Borreria densiflora DC. A coarse erect herb 30–60 cm. high; stipules, as in the other species, fringed with long bristles; leaves linear-lanceolate; flower heads large, usually 1.5 cm. or more in diameter.—Noticed only in sand under coconut trees about Tela, where it is frequent; widely distributed in Central America. *Borreria spinosa* S. & C. is a synonym of this species.

Borreria laevis (Lam.) Griseb. An erect or spreading, nearly glabrous herb, the stems usually about 30 cm. long; leaves lanceolate to ovate, conspicuously nerved, acute, nearly sessile; flower heads about 1 cm. in diameter.—A common weed in fields and thickets; common in most parts of Central America, and widely dispersed in tropical America. Known in Guatemala as "hierba del pájaro."

Borreria ocimoides (Burm.) DC. A slender, erect or spreading annual, very finely and sparsely pubescent; leaves small, lanceolate to ovate, obtuse or acute, short-petioled; flower heads 5–6 mm. broad.—A common weed of fields and gardens; abundant in many parts of Central America; one of the widely distributed weeds of tropical America generally.

CUCURBITACEAE. Gourd Family

The members of the gourd family are chiefly rough-pubescent herbs which climb by means of coiled tendrils. The mostly long-stalked leaves are either simple or pedately parted. The flowers, of two sexes, borne upon the same or different plants, have a 5-lobed calyx upon whose limb are inserted the 5 commonly white or yellow petals. There are three stamens, and the fleshy fruit is normally 3-celled.

ANGURIA L.

Anguria Warscewiczii Hook. f. A large glabrous herbaceous vine; leaves composed of 3 stalked leaflets, these mostly oblong or oblanceolate-oblong, acute or acuminate, and with more or less sinuate margins; flowers in short, densely flowered, long-stalked spikes; petals orange-scarlet, about 8 mm. long; fruits oblong, 5–6 cm. long, pointed at each end, pale green with dark green longitudinal stripes.—Occasional in swamps and thickets; ranging to Panama, Venezuela, and southern Mexico. The plant is rather conspicuous because of its brilliantly colored, although small flowers.

CAYAPONIA Manso

These plants are large rough vines with lobed leaves. The small or rather large flowers are solitary or in racemes. The nearly dry fruits contain few or numerous seeds.

Cayaponia attenuata (H. & A.) Cogn. A large vine, trailing over shrubs; leaves deeply 3-lobed, or the uppermost entire or nearly so; flowers small, about 5 mm. long, greenish white, solitary or in racemes; fruits globose, 1–1.5 cm. in diameter.—Occasional in wet thickets; frequent in Mexico and Central America. Known in Salvador by the names "taranta," "hierba del tamagaz," and "retámara." In that country the stems are sometimes used by the laundresses for rubbing dirt from clothes.

Cayaponia microdonta Blake. *Sandía de monte, Granadilla de monte.* A large vine, the rough leaves deeply 3-lobed; staminate

flowers solitary in the leaf axils, nearly 3 cm. long, the petals creamy white within and pale green outside; fruit oval, smooth, 2.5 cm. long or more, pale green with darker stripes.—Frequent in thickets; known also from Guatemala.

CITRULLUS Forsk.

Citrullus vulgaris Schrad. *Sandía. Watermelon.* The watermelon, a native of Africa, is planted in this region, as it is in most parts of Central America. As a rule, the Central American watermelons are small and of inferior quality, but only because inferior seed is planted.

CUCUMIS L.

Cucumis Melo L. *Melón. Muskmelon, Cantaloupe.* Muskmelons are of rather infrequent occurrence in Central America, but they are grown sometimes about Tela.

Cucumis sativus L. *Pepino. Cucumber.* This well-known vegetable, native of southern Asia, is grown commonly in most parts of Central America.

CUCURBITA L.

Cucurbita Pepo L. *Ayote. Squash.* Squashes of several varieties are grown about Tela, and they are one of the favorite vegetables of Central American gardens. In order to prepare them for the table they are boiled or roasted. In some parts of Central America certain forms are grown for their very young and tender fruits, only 2.5–5 cm. long, which are boiled and eaten. These "pipianes" are cultivated occasionally about Tela. The kernels of the seeds often are roasted and cemented together with sirup, to form a delicious confection somewhat resembling popcorn balls, and called "pepitorio."

ELATERIUM Jacq.

The plants of this genus are small vines with small, angled or shallowly lobed leaves, the upper ones often almost sessile. The staminate flowers, arranged in racemes, have a slender tube 2–3 cm. long, and a starlike limb. The fruits are obliquely ovoid, 3–4 cm. long, covered with soft spikelike tubercles, and they rupture elastically at maturity, somewhat like the seed pods of the garden balsam (*Impatiens Balsamina*).

Elaterium ciliatum Cogn. Leaves deeply cordate at the base, the margin of the sinus fringed with long white hairs, the blades

shallowly lobed and sinuate-toothed; flowers pale yellowish green.—Frequent in thickets; occurring throughout Central America. Called in Panama "gallotillo" and "ñorbo cimarrón"; in Costa Rica "chanchito" (little pig); in Salvador "cochinito" and "cuchinito." The young tender fruits and sometimes also the younger branches are cooked and eaten.

Elaterium gracile (H. & A.) Cogn. Much like the preceding species, but the leaves are not ciliate along the sinus.—Common in thickets, and often trailing over banks; ranging to Mexico and northern South America.

Feuillea cordifolia L. *Chichimora.* I was told that this plant grows wild in the Tela region, and also that the seeds are sent here from Salvador and other places. I have never seen the plant growing in Central America, but the very large, brown, corky seeds may be purchased from the *curanderos* in almost any market. The seeds, perhaps on account of their large size and unusual appearance, have a high reputation as a remedy for various diseases.

GURANIA Cogn.

Gurania Makoyana (Lem.) Cogn. *Plate LXVI.* A large herbaceous vine; leaves large, long-stalked, shallowly or deeply 3-lobed, with broad pointed lobes, densely and rather softly pubescent; flowers 2–3 cm. long, in dense long-stalked heads, the calyx lobes linear, bright orange-red; fruits oblong, about 6 cm. long, pale green, with the odor of cucumber.—Rather frequent in wet forest and thickets; ranging to Costa Rica and Guatemala.

LAGENARIA Ser.

Lagenaria leucantha (Lam.) Rusby. *Pepino chino. Calabash gourd.* A large, densely pubescent, ill-scented vine with deeply cordate, broad leaves; flowers large, white.—Planted sometimes in gardens and about houses; probably native of tropical Asia and Africa. Called "tula de mate" in Panama, and in Salvador "tarro," "tecomate," "tecomatillo," and "tol." The plant has been grown at Lancetilla for its young fruits, which, when tender, may be cooked and eaten, but they are of inferior quality and not likely to prove popular as a vegetable. The shells of the mature fruits are much used in Central America for dippers and as receptacles for food. In South America they are employed as receptacles from which the popular

maté beverage is sipped. The African calabash pipes are made from the fruits of this plant.

LUFFA Adans.

Luffa cylindrica (L.) Roem. *Paste. Sponge gourd.* A large vine, the leaves broad, very rough, with deep narrow acute lobes; flowers large, bright yellow, in long-stalked racemes; fruits large, smooth, the interior filled with a large fibrous mass resembling a sponge.—Frequent in thickets and open fields, native of the Old World tropics, but naturalized in Central America. The "sponges" are used locally like marine sponges, for which they provide a good substitute. They are often found on beaches, because they are easily transported by water.

MELOTHRIA L.

Melothria guadalupensis (Spreng.) Cogn. A small slender vine, the long-stalked small leaves deeply cordate, shallowly lobed or merely undulate or sinuate, rough; flowers very small, yellow; fruits usually 1.5–2.5 cm. long, green, smooth, resembling a small watermelon, with the odor of cucumber.—Common in thickets and fields; widely distributed in tropical America. Called "sandillita" in Panama. The fruits are eaten by the West Indians living in Panama. It may be that more than one species is represented by the specimens referred here, but the differences described as distinguishing the various species of *Melothria* seem decidedly trivial, and it is doubtful whether even the monographers have been able to see those they described.

MOMORDICA L.

Momordica Charantia L. *Pepino de monte. Balsam pear.* A large or small, slender vine; leaves slightly roughened, deeply 5-lobed, the lobes coarsely toothed; flowers small, bright yellow; fruits yellow or orange, oblong or fusiform, pointed, tubercled, splitting into 3 valves at maturity and exposing the seeds imbedded in red pulp.—Common in thickets; widely distributed in tropical America. Called "balsamino" in Panama, and in Salvador "balsamito." The pulp is eaten by children, and in some regions the young fruits are cooked and eaten, but the seeds often are reputed to be poisonous. In Honduras a decoction of the leaves is employed as a "blood tonic." The vines often form dense festoons over dead trees, and in such cases are rather ornamental.

SECHIUM Sw.

Sechium edule Sw. *Patastilla.* A large vine, the broad thin leaves shallowly lobed or nearly entire, rough, deeply cordate; staminate flowers small, green, in long racemes, the pistillate flowers solitary; fruits somewhat pear-shaped, 7–20 cm. long, green or nearly white, smooth or rough, and often covered with long slender fleshy spines; seed one.—Cultivated, but rather infrequently; one of the common vegetables of the Central American mountains. The young tender fruits are one of the favorite vegetables of Central America. This plant, the chayote, has been tested in the United States, but for some reason it has not proved popular there, doubtless because of its novelty and the innate conservatism of North Americans regarding foods. In some parts of Central America the name "chayote" is given to the plant, but in others the names "güisquil," "güisayote," "huisquil," and "huisayote" are used. It is, I believe, only in Honduras that the name "patastilla" is employed. All these terms are of Aztec origin.

The plant is somewhat peculiar in that all its parts are edible. The young shoots and flower buds are cooked as greens, and the large fleshy roots (called mere "raíz" in Costa Rica, and "chinta" or "chintla" in Salvador) are boiled as a vegetable, or cooked with sugar to make delicious dulces.

SICYDIUM Schlecht.

Sicydium tamnifolium (HBK.) Cogn. A large herbaceous vine; leaves long-stalked, ovate-cordate, acute, entire or nearly so, densely soft-pubescent; flowers very small, green or greenish white, in lax panicles; fruit globose, about 6 mm. in diameter, black at maturity.—Frequent in swamps and thickets; widely distributed in tropical America.

LOBELIACEAE. Lobelia Family

The plants here listed are herbs with more or less milky sap, the leaves alternate, simple, and without stipules. In the small or large, perfect, commonly irregular flowers the calyx (mostly 5-lobed) is united with the ovary, and the corolla, of united petals, has a slender or thick tube and a 5-lobed or 2-lipped limb. The normally 5 stamens are connate by their anthers about the style.

LOBELIA L.

Lobelia splendens Willd. *Cardinal flower.* A tall perennial herb; leaves large, narrowly lanceolate, acuminate, finely toothed;

flowers cardinal-red, 3 cm. long, arranged in dense terminal racemes. —Occasional in wet fields; widely distributed in tropical America. Known in Panama as "flor de garza." This species is little different from the common cardinal flower (*L. cardinalis* L.) of the United States.

SPHENOCLEA Gaertn.

Sphenoclea zeylanica Gaertn. A bushy-branched glabrous herb a meter high or less; leaves petioled, entire, elliptic to lanceolate, acute or obtuse; flowers small, white, in very dense, long or short, stalked spikes.—Occasional about Tela in marshes and swamps; widely distributed in the tropics of both hemispheres. This plant has but slight superficial resemblance to the northern plants referred to the family Lobeliaceae.

COMPOSITAE. Aster Family

This is one of the largest families of plants, usually easy of recognition because of the arrangement of the flowers, after the pattern of those of an aster, daisy, goldenrod, or sunflower. The plants are herbs or shrubs, in the tropics sometimes good-sized trees, occasionally scandent, with opposite or alternate, simple or variously compound leaves. The flowers are arranged in heads, surrounded by an involucre composed of bracts or phyllaries. The flowers are generally of two kinds: disk flowers, on the center of the receptacle, usually perfect; and marginal or ray flowers, usually pistillate or sterile, about the margin of the receptacle. The ray flowers, when present, have a strap-shaped corolla, like the "petals" of a daisy; the disk flowers usually have a tubular corolla. The anthers are united to form a narrow tube. The fruit is an achene, the calyx usually being represented on its apex by pappus, which consists of bristles or scales. The Compositae occurring in the lowlands of tropical America, in such a region as that about Tela, are usually widely dispersed weedy species.

SPARGANOPHORUS Crantz

Sparganophorus Vaillantii Crantz. A coarse, nearly glabrous, apparently perennial herb a meter high or less; leaves alternate, petioled, mostly oblanceolate, toothed or nearly entire, acuminate; heads greenish white or white, sometimes purplish, 4–5 mm. high, sessile and clustered in the leaf axils; achenes 3–4-angled, the pappus a short crown.—Frequent in ditches, marshes, or swamps; widely distributed in tropical America.

PIPTOCARPHA R. Br.

Piptocarpha chontalensis Baker. A shrub 3–4.5 meters high, the branches long, slender, and recurved, or sometimes scandent; leaves alternate, short-petioled, ovate or elliptic, acuminate, nearly entire, densely and minutely tomentose beneath; flower heads small, clustered in the leaf axils, without rays; pappus of 2 series of slender bristles.

VERNONIA Schreb.

The Vernonias of Central America are very different in general appearance from the ironweeds of the same genus, which are so plentiful in many parts of the United States. They are herbs or shrubs with alternate, often nearly sessile leaves which are entire or nearly so. The many-flowered small heads are sessile or stalked, the branches of the inflorescence often being scorpioid, or one-sided. The heads have no rays. The pappus consists of 2 series, the outer of short scales or bristles, the inner of long bristles.

Vernonia cinerea (L.) Less. An erect annual with broadly ovate, slender-petioled, pubescent leaves; heads purple, slender-stalked, in panicled cymes.—A weed in garden at Lancetilla, probably a recent introduction; native of the Old World tropics, but naturalized as a weed in many parts of tropical America.

Vernonia patens HBK. *Cucunango.* A stout shrub about 2 meters high; leaves oblong or lanceolate, shortly petioled, nearly or quite entire, minutely pubescent beneath and often rather rough; heads white, sessile, the flowers pleasantly fragrant.—In thickets about Progreso; widely distributed in tropical America. Known in Panama as "lengua de vaca," "salvia," and "lengua de buey"; in Costa Rica as "tuete"; and in Salvador as "suquinay," "palo blanco," and "pie de zope."

Vernonia scorpioides (Lam.) Pers. Plants suffrutescent, 1–2 meters high, simple or sparsely branched; leaves ovate or lanceolate, acuminate, slender-petioled, slightly toothed, rather softly pubescent beneath; flower heads small, pale purple, sessile along one side of the recurved branches.—Collected in thickets at La Ceiba, and probably occurring also in the Tela region; widely distributed in tropical America.

ELEPHANTOPUS L.

Elephantopus mollis HBK. A coarse erect herb a meter high or less, densely pubescent; leaves alternate, oblong to obovate, most

of them borne at or near the base of the stem, crenate; flowers white or purplish, the heads with 5 or fewer flowers, arranged in dense bracted heads at the ends of the few branches; achenes 10-ribbed, pubescent, the pappus of a few bristles which are dilated at the base. —Infrequent; widely distributed in tropical America.

PSEUDELEPHANTOPUS Rohr

Pseudelephantopus spicatus (Juss.) Rohr. (*Distreptus spicatus* Cass.) *San Antonio.* A coarse erect herb, rarely 1 meter high, sparsely branched; leaves alternate, obovate or elliptic, entire or nearly so, dilated and clasping at the base, sparsely hairy or often nearly glabrous; flowers purple, the small 4-flowered heads arranged in long leafy interrupted spikes; pappus of 10–15 bristles.—A common weed of thickets and waste ground; one of the most widely distributed weeds of tropical America. In Panama called "escobilla blanca" and "chicoria"; in Costa Rica "escoba real"; in Salvador 'amor seco," "escoba," and "oreja de coyote." The stiff stems tied together sometimes are used as brooms in country houses. The plant is used occasionally in domestic medicine.

AGERATUM L. Ageratum

Ageratum conyzoides L. An erect hairy annual herb a meter high or less, branched; leaves opposite, long-petioled, ovate or deltoid, obtuse or acute, crenate; heads 5 mm. long, lavender, without rays, arranged in small corymbs; achenes 5-angled, the pappus of 5 awned scales.—In fields about Progreso; not noted near Tela; widely distributed as a weed in tropical America. Known in Salvador by the name "mejorana." Closely related forms of this genus are cultivated for ornament in the United States.

EUPATORIUM L.

The genus is a large one in Central America. It consists of herbs or shrubs, or sometimes small trees, with mostly opposite, toothed leaves. The small or large heads are white, purple, or pink, and have no rays; their bracts are thin and nerved. The achenes are 5-angled, their pappus of slender whitish bristles.

Eupatorium albicaule Sch. Bip. *Tiñe-cordel, Putunín.* A slender shrub or tree 2.5–4.5 meters high; leaves short-petioled, lanceolate to oblong-ovate, small, long-acuminate, serrate, conspicuously 3-nerved, glabrous or nearly so; heads 7–8-flowered, in

small dense corymbs.—Frequent in thickets; ranging northward into Mexico. The plant is employed locally for imparting a green dye to twine, cloth, and other articles.

Eupatorium araliaefolium Less. A large epiphytic shrub, glabrous except in the inflorescence; leaves petioled, oblong-elliptic, acute, entire, usually dark when dried, large; heads 1 cm. long, white, in large panicles.—On trees on the high hills above Lancetilla; extending to southern Mexico. This species is remarkable for its epiphytic habit, which is rare in this family.

Eupatorium macrophyllum L. A coarse herb often 2 meters high, simple or branched; leaves large and thin, rounded-ovate or deltoid-ovate, softly pubescent, acuminate, crenate, at the base truncate or somewhat cordate; flower heads small, greenish white, in panicled corymbs.—A common weed of clearings, and growing also in wet thickets; widely distributed in tropical America. A weedy and unattractive plant.

Eupatorium morifolium Mill. *Cerbatana. Plate LXVII.* A shrub or tree 2.5–4.5 meters high, often forming small dense thickets, simple or branched; leaves large, petioled, ovate to rounded, crenate-serrate, acute, truncate to subcordate at the base, nearly glabrous; heads small, 6–13-flowered, white, in dense panicles.—Frequent in wet thickets; widely distributed in tropical America. Known in Salvador by the names "vara hueca," "taco," "chimaliote," "carrizo," and "suelda con suelda." The stems are hollow.

Eupatorium odoratum L. *Crucito, Rey del todo.* A large herb or more commonly a shrub, often with long, recurved or clambering branches; leaves rhombic-ovate or deltoid, acute or acuminate, coarsely toothed or sometimes entire; heads lavender or nearly white, cylindrical, arranged in small corymbs, 10–12 mm. long.—Common in thickets; widely dispersed in tropical America. Called "paleca" and "hierba de chiva" in Panama, and "chimuyo" in Salvador. The shrub is rather showy when in flower, but it is so common and so weedlike that it is not especially attractive.

Eupatorium vitalbae DC. A large woody vine, nearly glabrous; leaves short-petioled, oblong-ovate, 3-nerved, long-acuminate, coarsely toothed, thick and shining; heads 10–12 mm. high, pink or purple, showy, arranged in small corymbs.—In a wooded swamp near Tela; frequent in many parts of Central America. The shrub is a handsome one when in full flower.

MIKANIA Willd.

The Mikanias are herbaceous or woody vines with opposite, petioled, toothed or entire leaves, and with small, white or greenish heads arranged in cymes or racemes. The heads are 4-flowered, with an involucre of 4 narrow bracts, and the 5-angled achenes have a pappus of numerous slender bristles.

Mikania cordifolia (L. f.) Willd. A large herbaceous vine; leaves long-petioled, broadly ovate, deeply cordate at the base, undulate or shallowly and inconspicuously toothed, finely pubescent; heads in cymes, the flowers white or dirty white.—Common in wet thickets; widely distributed in tropical America.

Mikania guaco HBK. An herbaceous or woody vine, climbing high over shrubs and small trees; leaves large, ovate, acute or decurrent at the base, nearly entire, almost or quite glabrous; heads pale green or greenish yellow, arranged in cymes; pappus brownish.—Frequent in wet thickets; ranging to South America. In some regions the plant is considered to be an efficient remedy for snake bites.

Mikania Houstoniana (L.) Robinson. A large herbaceous vine, climbing over shrubs and small trees; leaves long-petioled, ovate, acuminate, obtuse to rounded at the base, entire, glabrous or nearly so; heads small, greenish white, arranged in long panicled racemes.—Frequent in wet thickets; widely distributed in tropical America.

Mikania leiostachya Benth. A large herbaceous vine; leaves petioled, oblong-ovate, long-acuminate, rounded at the base, entire; heads small, greenish white, arranged in slender panicled spikes.—Frequent in wet thickets; ranging to Panama.

Mikania micrantha HBK. A small or large, herbaceous vine; leaves long-petioled, acuminate, deeply cordate at the base, undulate or irregularly somewhat toothed, glabrous or nearly so; heads small, white, arranged in small dense cymes.—Abundant in wet thickets, often forming dense tangles over coarse herbs and bushes; widely distributed in tropical America. The flowers, like those of some of the other species, have a strong odor of vanilla.

Mikania punctata Klatt. A large herbaceous vine; leaves long-petioled, large, glabrous or nearly so, deltoid-ovate, acute or acuminate, deeply cordate at the base, often somewhat lobed or angled; heads 9–10 mm. long, greenish white, in pyramidal panicles.—In wet thickets; extending to southern Mexico and to Costa Rica.

BRICKELLIA Ell.

Brickellia diffusa (Vahl) Gray. A bushy erect annual, often 2 meters high, minutely pubescent or nearly glabrous; leaves mostly opposite, long-petioled, broadly deltoid-ovate, thin, crenate, 3-nerved; heads 7 mm. long, without rays, greenish white, very numerous, arranged in large open panicles; achenes 10-striate, the pappus of long white bristles.—Frequent in thickets or clearings; widely distributed in tropical America. A common weed in many parts of Central America.

EGLETES Cass.

Egletes viscosa (L.) Less. An erect bushy-branched herb 30–60 cm. high, densely viscid-villous; leaves alternate, deeply lobed, the petioles broadly margined, dilated at the base; heads small, yellow, without rays, few; bracts imbricated in few series; achenes flattened, the pappus a thickened ring.—Noted only in fields about La Fragua; widely distributed in tropical America. An inconspicuous weedy plant. Called "orejona" in Salvador.

ASTER L.

This genus, which has so many species in temperate North America, has but few representatives in the tropics.

Aster exilis Ell. An erect glabrous annual, less than a meter high, sparsely branched; leaves alternate, linear to narrowly lanceolate, entire or nearly so; heads small, cymose-panicled, the disk yellow, the small rays lavender, the bracts narrow and imbricated in several series; pappus of slender bristles.—In grassy fields about La Fragua; widely distributed in tropical America, and ranging to the United States. An inconspicuous plant.

ERIGERON L. Fleabane

The local representatives of this large genus are inconspicuous weeds. They are annuals with narrow alternate leaves, and with small, greenish white, panicled heads which have minute and hardly perceptible rays, the involucre composed of numerous linear, nearly equal bracts. The compressed achenes have a pappus of slender tawny bristles.

Erigeron bonariensis L. *Culantrillo.* An erect hairy herb, often a meter high; leaves oblanceolate-linear, entire or with a few coarse teeth; heads 6–7 mm. long.—Frequent in thickets and clearings;

widely distributed in tropical America. Called "tabaquillo" in Panama.

Erigeron pusillus Nutt. A nearly glabrous herb a meter high or less; leaves narrowly linear; heads 3 mm. high.—Occasional in fields and thickets; widely distributed in tropical America. Called "incensio" in Salvador. The plant is very similar in general appearance, and closely related to the common horseweed, *Erigeron canadensis* L., of the United States.

GNAPHALIUM L.

Gnaphalium purpureum L. An erect annual, commonly 60 cm. high or less, covered with loose cobwebby whitish hairs; leaves alternate, oblanceolate, entire, usually rounded at the apex; heads very small, clustered, without rays, the bracts dry and papery; pappus of slender whitish bristles.—A weed in garden at Lancetilla, doubtless introduced; widely distributed in tropical America, and also in temperate regions.

BACCHARIS L.

Baccharis trinervis (Lam.) Pers. var. **rhexioides** (HBK.) Baker. A shrub, erect or with long, arching or recurved branches; leaves alternate, short-petioled, lance-oblong, 3-nerved, entire, sparsely pubescent; heads 6–7 mm. long, whitish, dioecious, without rays, in small dense corymbs at the ends of the branches; achenes 10-nerved, the pappus of numerous dirty-white bristles.—In thickets or clearings, rare here; widely distributed in tropical America. Called "barba fina" in Guatemala; "canutillo," "hierba de Santo Domingo," and "tapabarranco" in Salvador.

LAGASCEA Cav.

Lagascea mollis Cav. An erect annual, usually about 60 cm. high, pubescent with appressed grayish hairs, branched; leaves mostly opposite, long-petioled, broadly ovate, coarsely toothed; heads 1-flowered, clustered at the ends of the branches, pale purple, small, subtended by herbaceous bracts; pappus a short cup.—A frequent weed in open fields in the region of Progreso, but not noticed in the immediate vicinity of Tela; widely distributed in tropical America.

BALTIMORA L.

Baltimora recta L. An erect branched annual, a meter high or less; leaves opposite, slender-petioled, broadly ovate, crenate,

rough-pubescent, acute or acuminate; heads 5 mm. high, the involucre of few broad acuminate strigose bracts; rays yellow, showy, the receptacle chaffy; achenes 3-angled, glabrous, smooth or tubercled, the pappus a short cuplike crown.—In open fields or in thickets, infrequent; widely distributed in tropical America. Called "flor amarilla" in Salvador and "mirasol" in Guatemala.

ZINNIA L.

Zinnia multiflora L. *Ambolia. Zinnia.* An erect annual; leaves opposite, ovate to oblong, sessile, entire; heads large, long-stalked, with showy, mostly red or purple rays.—Cultivated commonly in the region, and sometimes escaping to waste places; believed to be a native of Mexico, but probably not known in a truly wild state. Called "margarita" and "girasol" in Panama, and "cambray" in Salvador. This is one of the favorite ornamental plants of Central America.

Montanoa hibiscifolia (Benth.) Sch. Bip., a shrub or small tree with large broad lobed leaves, and showy white-rayed heads, is planted for ornament at Lancetilla, and may become more widely distributed locally. It is a native of some parts of Central America, and a very showy and handsome plant when in blossom.

ECLIPTA L.

Eclipta alba (L.) Hassk. An erect or prostrate, strigose herb, the leaves opposite, sessile or petioled, linear to oblong-lanceolate, inconspicuously toothed; heads small, 6-9 mm. broad, stalked, solitary or in pairs, in the axils or at the ends of the branches, the rays minute, whitish, inconspicuous; involucre of about 2 series of nearly equal green bracts; achenes angled or compressed, glabrous, the pappus a low toothed crown.—Common in open fields; widely dispersed in most tropical regions, and abundant in many parts of Central America. An inconspicuous weed, which grows also in the United States.

WEDELIA Jacq.

Wedelia trilobata (L.) Hitchc. A coarse, creeping or procumbent herb, rooting at the joints, villous; leaves opposite, sessile or nearly so, wedge-shaped at the base, often shallowly 3-lobed; heads 1.5 cm. broad, long-stalked, the bracts green, the rays bright yellow,

large; pappus cuplike.—Frequent along ditches, also growing on or near the beach; widely distributed in tropical America. Called "clavellín de playa" in Panama.

ELEUTHERANTHERA Poit.

Eleutheranthera ruderalis (Sw.) Sch. Bip. A much branched annual, erect or prostrate, pubescent; leaves opposite, petioled, chiefly ovate, shallowly toothed; heads very small, yellow, without rays, nearly sessile in the forks of the branches and in the upper axils, the involucre of 5–10 unequal bracts, the outer ones herbaceous; achenes pubescent and muricate, the pappus a toothed crown with sometimes 2–3 short bristles.—Frequent in fields and thickets; widely distributed in tropical America. An inconspicuous weedy plant.

MELANTHERA Rohr

Coarse erect herbs, often very rough; leaves opposite, long-petioled, coarsely toothed and often hastate-lobed; heads about 1 cm. broad, white, without rays, the involucre of 2–3 series of unequal ovate bracts; anthers black; disk with stiff sharp-pointed scales; achenes compressed-tetragonous, the pappus of deciduous awns.

Melanthera aspera (Jacq.) Steud. Plants often 1.5 meters high or more; leaves very rough, not fleshy.—Frequent in thickets; widely distributed in tropical America. Known in Panama by the names "sirvulaca," "Julio," and "clavellina de monte," and in Salvador as "botoncillo." The black anthers contrast conspicuously with the dull white flowers. One of the collections from Lancetilla has been determined as *M. hastifolia* Blake, but evidently it is conspecific with other material referred to *M. aspera*. The species of this genus have been multiplied with but little excuse, and it is the writer's belief that nearly all of them must be reduced to synonymy.

Melanthera nivea (L.) Small. A bushy-branched coarse herb a meter high; leaves thick and fleshy, nearly glabrous, scarcely at all roughened.—Common along the beaches, and confined to such situations; also in the West Indies, Mexico, and the southern United States.

ZEXMENIA Llave

Zexmenia scandens Hemsl. A coarse shrub 1–3 meters high, with recurved or subscandent branches; leaves opposite, petioled, ovate to oblong, serrate or nearly entire, very rough; heads 5–7

mm. high, stalked, in small cymes, the bracts green, ovate to oblong, obtuse or acute; rays bright yellow, showy; achenes winged.—Common in thickets; extending to southern Mexico. Beginning to blossom in March. A very handsome and showy shrub when in full bloom.

HELIANTHUS L.

Helianthus annuus L. *Mirasol. Sunflower.* The common annual sunflower, native of the western United States, is seen occasionally as an ornamental plant in Honduran gardens.

VERBESINA L.

Verbesina myriocephala Sch. Bip. *Tabaquillo, Tabaco de monte.* A tall coarse herb or shrub 1.5–3 meters high, simple or sparsely branched above; leaves mostly alternate, very large, deeply pinnate-lobed, pale and densely pubescent beneath; heads small, white, with short rays, arranged in very large, broad corymbs; achenes compressed and broadly winged.—Frequent in thickets; widely distributed in Central America. Known in Panama as "cerbatana" and "lengua de buey," and in Salvador by the name "chimaliote." A conspicuous plant because of its large size and showy leaves.

SPILANTHES Jacq.

Spilanthes americana (Mutis) Hieron. An erect or decumbent herb about 60 cm. high; leaves opposite, petioled, ovate, inconspicuously toothed or almost entire; heads 8 mm. long, long-stalked, bright yellow, with a conical receptacle and globose disk, the rays short; pappus none.—In weedy fields, rare here; widely distributed in tropical America.

SYNEDRELLA Gaertn.

Synedrella nodiflora (L.) Gaertn. An erect or procumbent, much-branched annual, sometimes rooting at the lower nodes, strigose-pubescent; leaves opposite, petioled, ovate, shallowly toothed; heads small, yellow, sessile and clustered in the forks of the branches or in the leaf axils; bracts few, narrow, the outer one or two commonly herbaceous; ray achenes with 2 stiff spines at the apex.—In fields and thickets about Progreso, and probably elsewhere; a widely distributed weed of tropical America.

COSMOS Cav.

Cosmos caudatus HBK. An erect branched glabrous herb a meter high; leaves opposite, divided into numerous narrow segments;

heads large, long-stalked, the involucre of 2 distinct series of bracts; achenes slender, 5-angled, narrowed into a long slender beak, with 2 short barbed awns at the apex; rays rose-purple.—An occasional weed in open fields; widely distributed in tropical America. Called "clavellina" in Panama, and in Salvador "mozote doradilla" and "cambray montés."

BIDENS L.

The plants are herbs or shrubs with opposite, parted leaves, the leaves in the species here listed having few broad divisions. The small or medium-sized heads are stalked, their bracts in 2 distinct series. The slender angled achenes bear at the apex 2–4 barbed awns.

Bidens pilosa L. *Mozote.* A coarse erect herb a meter high or less; leaves with 3–5 coarsely toothed leaflets; heads 1 cm. long, yellow, without rays.—A frequent weed in fields and thickets; widely dispersed in tropical America. Known in Panama by the names "sirvulaca," "arponcito," and "cadillo," and called "mozotillo" in some parts of Central America. The West Indians living in Panama call the plant "Spanish needles." The achenes adhere tenaciously to clothing by their barbed awns.

Bidens pilosa L. var. **radiata** Sch. Bip. *Mozote.* Heads with short white rays.—Common in clearings and thickets.

Bidens squarrosa HBK. A large herbaceous vine; leaves simple or with 3–5 leaflets, these ovate to lanceolate, nearly glabrous; heads with large, bright yellow rays.—In wet thickets near Progreso; ranging from Mexico to South America. Known in Salvador by the name "flor de colmena."

TRIDAX L.

Tridax procumbens L. *Hierba del toro.* A hairy procumbent annual; leaves opposite, petioled, coarsely toothed; heads on very long, naked peduncles, pale yellow, with short cream-colored rays; achenes hairy, the pappus of numerous featherlike bristly scales; involucre of few obtuse bracts, the outer ones herbaceous.—Scarce about Tela, but common in the region of Progreso; widely distributed in tropical America, and one of the most abundant weeds of Central America.

POROPHYLLUM Adans.

Glabrous strong-scented herbs, bushy-branched; leaves mostly alternate, slender-petioled, crenate, bearing large glands along the

margins; heads long-stalked, without rays, the bracts in a single series; achenes linear, the pappus of numerous brown or yellowish bristles.

Porophyllum macrocephalum DC. An herb a meter high; leaves mostly oval, obtuse; flowers very dark red; achenes 12 mm. long.—In thickets near Progreso; extending northward into Mexico.

Porophyllum punctatum (Mill.) Blake. A bushy herb 1.5 meters high; leaves elliptic to lanceolate; flowers pale greenish yellow; achenes 6 mm. long.—Near Progreso; widely distributed in tropical America.

TAGETES L.

Tagetes erecta L. *Flor del muerto. Marigold.* A strong-scented glabrous erect branched annual; leaves opposite, pinnately parted; heads large, long-stalked, yellow, the involucre of a single series of bracts.—Cultivated commonly for ornament, and sometimes escaping; probably native of Mexico, but scarcely known in a truly wild state. Called "clavellina" and "amapola" in Panama. This is a favorite ornamental plant of Central America, and it is often planted in cemeteries, hence, probably, the common name used in Honduras.

CHRYSANTHEMUM L.

Chrysanthemum indicum L. *Rosa de novia. Chrysanthemum.* Small-flowered forms of the common chrysanthemum are grown occasionally in pots in Honduras. The plants do not thrive in Central America except sometimes in the mountains.

LIABUM Adans.

Liabum sp. Fallen leaves belonging to this genus were found at various times on the hillsides above Lancetilla, but it was impossible to obtain flowering specimens of the epiphytic shrub from which they had fallen.

SCHISTOCARPHA Less.

Schistocarpha oppositifolia (Kuntze) Rydb. A coarse erect herb about a meter high; leaves large, opposite, long-petioled, broadly ovate, toothed, sparsely pubescent; heads panicled, 6–9 mm. high, yellow or greenish yellow, without rays; achenes glabrous, the pappus of slender soft bristles.—Frequent in thickets and clearings; ranging to Mexico and South America. Except for its yellowish flowers, the plant strongly suggests a species of *Eupatorium.*

NEUROLAENA R. Br.

Neurolaena lobata (L.) R. Br. *Tres puntas. Plate LXVIII.* A coarse herb 1–3 meters high; leaves alternate, short-petioled, rough-pubescent, the lower ones deeply 3-lobed, coarsely toothed; heads yellowish green, 1–1.5 cm. high, arranged in small dense corymbs; achenes 10-striate, the pappus of long soft bristles.—Common in thickets; widely distributed in tropical America. Called "gavilana" in Costa Rica and Salvador, and in Guatemala "mano de lagarto" and "tabaquillo." The plant is bitter, and in Honduras it has a high reputation as a domestic remedy for malaria. It is said to be planted sometimes on this account, although usually it is sufficiently abundant to obviate any necessity of cultivation.

ERECHTITES Raf.

Erechtites hieraciifolia (L.) Raf. A rather fleshy, erect annual, somewhat pubescent; leaves alternate, mostly lanceolate, coarsely toothed, sessile or short-petioled; heads yellowish green, 1.5 cm. high, without rays, arranged in small corymbs, the bracts linear, in a single series; achenes 10-striate, the pappus of numerous long soft white bristles.—Frequent in fields and clearings; widely distributed in tropical America, and extending to the United States. Called "tabaquillo" in Panama, "té del suelo" in Salvador, and "fireweed" in the United States.

EMILIA Cass.

Emilia sonchifolia (L.) DC. A nearly glabrous, erect annual less than a meter high; leaves deeply lobed, their bases broad and clasping; heads 1 cm. high, purple, without rays, the linear bracts in a single series; achenes slender, 5-angled, the pappus of numerous soft white bristles.—A frequent weed in open fields; native of the Old World tropics, but widely naturalized in America.

SENECIO L.

Senecio confusus Britten. A large scandent herb or shrub, nearly glabrous; leaves alternate, petioled, ovate, acuminate, toothed; flower heads 1 cm. long, slender-stalked, in cymes at the ends of the branchlets, the bracts linear, equal, the rays orange; pappus of soft white bristles.—In thickets, infrequent; extending to southern Mexico.

CIRSIUM Hill

Cirsium costaricense (Polak.) Petrak. *Thistle.* A coarse erect herb, 1.5–2.5 meters high, branched; leaves alternate, pinnate-lobed, the margins armed with slender sharp spines; flower heads very large, purple, without rays; pappus of long soft plumose whitish bristles.—Occasional in thickets and clearings; extending southward to Panama.

CHAPTALIA Vent.

Chaptalia nutans (L.) Polak. A scapose perennial herb; leaves basal, oblong or obovate, pinnate-lobed, obtuse, green above, white-tomentose beneath; scapes tall, the single head 2–3 cm. long, with numerous narrow imbricated bracts, the short rays dark purple-red; achenes slender-beaked, the pappus of numerous soft tawny bristles.—Frequent in pastures and open fields; widely distributed in tropical America. Called "valeriana" in some parts of Honduras and in Salvador.

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FORESTED HILLS ABOVE LANCETILLA EXPERIMENT STATION

A typical aspect of the hill forest of the Honduran coast

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LANCETILLA EXPERIMENT STATION

Looking southward. The hills are covered with practically primeval forest

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FOREST NEAR LANCETILLA

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COROZO PALM THICKETS

A characteristic type of vegetation of the lowland forest of the Atlantic coast of Central America

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A GIANT CEIBA TREE

Such huge trees are frequent in the Central American lowlands. Note the broad thin buttresses

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HEMIONITIS PALMATA

A common terrestrial fern. Note the adventitious plantlet on one of the fronds

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CHAMAEDOREA PACAYA

A common small palm of the deep forest

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DESMONCUS POLYACANTHOS

A climbing palm. Note the reflexed spines of the leaf tip

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GEONOMA BINERVIA

A common palm of dense forest

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GEONOMA GLAUCA
A frequent species of deep forest

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CARLUDOVICA OERSTEDII
A relative of the palms

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ANTHURIUM SCOLOPENDRINUM
A common epiphytic aroid

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MONSTERA PERTUSA

A large epiphytic vine, remarkable for the perforations of the leaves

ERRATUM

The plant illustrated is *Tillandsia compressa*, which should appear on Plate XVIII. *Monstera pertusa* is shown on Plate XVIII.

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PHILODENDRON GUTTIFERUM

A large epiphytic vine of the arum family

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PHILODENDRON RADIATUM
An epiphytic climbing aroid

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XANTHOSOMA ROSEUM

A common aroid along streams. Greatly reduced

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AECHMEA BRACTEATA

An epiphytic bromeliad, or air-plant, with red inflorescence

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TILLANDSIA COMPRESSA

A common bromeliad, or air-plant

ERRATUM

The plant illustrated is *Monstera pertusa*, which should appear on Plate XIII. *Tillandsia compressa* is shown on Plate XIII.

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XIPHIDIUM CAERULEUM

A characteristic plant of forest and thickets

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HELICONIA BIHAI

A relative of the banana. Bracts red and yellow

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HELICONIA CRASSA

One of the "wild plantains." A common forest species

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COSTUS SPICATUS

A frequent forest plant of the ginger family

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CALATHEA INSIGNIS

A characteristic forest plant of the arrowroot family

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CALATHEA LUTEA

An abundant tall plant of open swamps

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CALATHEA MACROSEPALA
A frequent plant of deep forest

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PLEIOSTACHYA PRUINOSA
Common in swamps and forest

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MAXILLARIA RUFESCENS
An epiphytic orchid

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SOBRALIA DECORA

A handsome epiphytic orchid with rose-purple flowers that last only a few hours

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TRIGONIDIUM EGERTONIANUM

A common epiphytic orchid with bronze flowers

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LACISTEMA AGGREGATUM

A frequent small tree of lowland thickets

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PEPEROMIA GOLLII

A fleshy-leaved epiphyte of the pepper family

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PIPER AURITUM

A common pepper with aromatic foliage. A shrub or small tree

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MYRIOCARPA YZABALENSIS

A member of the nettle family. A shrub or small tree with pendent threadlike flower spikes

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CHICHICASTE (URERA BACCIFERA)

A tree nettle that stings severely

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POKEWEED (PHYTOLACCA RIVINOIDES)

Similar to the common pokeweed of the United States; common in clearings

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WILD NUTMEG (VIROLA GUATEMALENSIS)

A common large tree, closely related to the nutmeg of commerce. The seeds, with their lacelike aril, are very beautiful

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HIRTELLA GUATEMALENSIS
A shrub or small tree of the rose family

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PITHECOLOBIUM ARBOREUM

A common leguminous tree of stream banks. Flowers white

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CYNOMETRA RETUSA

A leguminous tree growing along tidal streams

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HONDURAS ROSEWOOD (DALBERGIA CUBILQUITZENSIS)

A common tree, yielding fine wood

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ACALYPHA COSTARICENSIS

A frequent weedy shrub of the spurge family

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CROTON GLABELLUS
A tree of the spurge family

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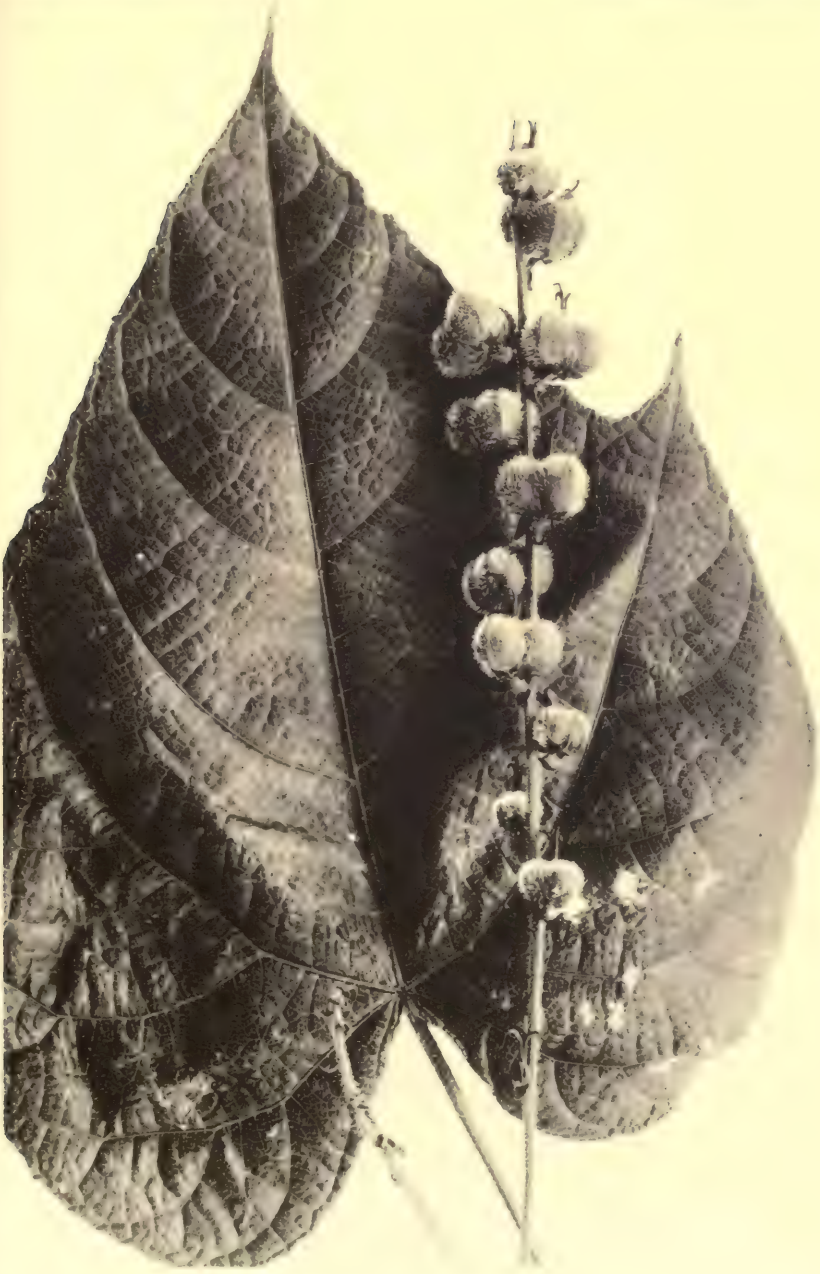

TRAGIA BAILLONIANA

A vine of the spurge family, with stinging hairs

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PATE (PAULLINIA SCARLATINA)

A woody vine, sometimes used as a fish poison

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LUEHEA SEEMANNII

A giant tree of the linden family

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MALVAVISCUS CUTTERI

A handsome red-flowered shrub of the mallow family

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CARPOTROCHE PLATYPTERA

A small tree. Flowers and fruits borne mostly along the older branches

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CASEARIA ARGUTA

A common shrub or small tree of the Flacourtia family

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HASSELTIA MEXICANA
A common small tree; flowers white

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XYLOSMA SYLVICOLA

A characteristic small tree of dense forest

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PASSION-FLOWER (PASSIFLORA BIFLORA)
A slender herbaceous vine

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BEGONIA POPENOEI

A common wild begonia of the wet forest

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CONOSTEGIA XALAPENSIS

A frequent small tree of the melastome family; fruit edible

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MICONIA IMPETIOLARIS

An abundant shrub of the melastome family

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STEMMADENIA DONNELL-SMITHII

A small tree with milky sap and yellow flowers

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VARA BLANCA (AEGIPHILA FASCICULATA)
A common shrub of second-growth thickets

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CESTRUM PANAMENSE

A shrub of the potato family

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CYPHOMANDRA MOLLICELLA

A shrub or large herb of the potato family

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LYCIANTHES VULPINA

A woody vine of the potato family

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APHELANDRA AURANTIACA

A red-flowered herb, common in deep forest

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DIATEINACANTHUS HONDURENSIS

A small shrub with pale yellow flowers

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JACOBINIA UMBROSA

A showy coarse herb with bright yellow flowers

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PSYCHOTRIA MARGINATA

A common shrub of the madder family

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FARAMEA STENURA

A blue-flowered shrub or small tree

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GURANIA MAKOYANA

A vine of the gourd family, with orange-red flowers

EUPATORIUM MORIFOLIUM

A shrub of the composite family, with dirty-white flowers

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TRES PUNTAS (NEUROLAENA LOBATA)

A coarse yellow-flowered herb of the composite family, used medicinally

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NATURAL HISTORY

FIELD MUSEUM OF NATURAL HISTORY
FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 283

BOTANICAL SERIES VOLUME X

FLORA OF THE LANCETILLA VALLEY HONDURAS

BY

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EDITOR

CHICAGO, U. S. A.
JANUARY 15, 1931

UNIVERSITY OF ILLINOIS-URBANA
3 0112 001367868